CUTTING PLOTTER

FC8000-60/75/100/130/160

SERVICE MANUAL

FC8000-UM-251-01-9370

GRAPHTEC

HISTORY OF REVISIONS

No.	Date issued	Description of revision	Page	Edition
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1. INTRODUCTION

1.1 Main Specifications

	FC8000-60	FC8000-75	FC8000-100	FC8000-130	FC8000-160
CPU	32-bit				
Configuration	Grit-rolling plotter				
Drive	Digital servo				
Max. cutting area (expanded mode)	50 m x 610 mm	50 m x 762 mm	50 m x 1067 mm	50 m x 1372 mm	50 m x 1626 mm
Guaranteed precision cutting area *1	15 m x 590 mm	15 m x 742 mm	15 m x 1047 mm 10m x 894 mm	15m x 1352 mm 10m x 894 mm	15 m x 1606 mm 10m x 894 mm
Mountable media width	Max. 730 mm, Min. 50 mm	Max. 901 mm, Min. 50 mm	Max. 1206 mm, Min. 50 mm	Max. 1511 mm, Min. 50 mm	Max. 1765 mm, Min. 50 mm
Max. cutting speed (Axial)	148.5cm/sec (45 ips)				
Specifiable speeds	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 70, 80, 90, 100, 105 cm/sec				
Cutting pressure	48 steps, 0.196-5.88N (20-600gf)				
Min. character size	3 mm (0.125 in.) alphanumeric Helvetica med. Font				
Mechanical resolution	0.005mm				
Programmable resolution	GP-GL: 0.01/0.05/0.025/0.01 mm, HP-GL: 0.025 mm*2				
Repeatable accuracy *1	Max. 0.1 mm/2-m unit (excluding media shrinkage)				
Number of cutters/pens	1 (2 for the optional 2-pen models)*3				
Pen types	Water-based fiber-tip, oil-based ballpoint and disposable ink pens				
Pouncing tool type	Pouncing tool: PPA33-TP12, 1.2-mm pin diameter) *4				
Compatible media	Mono-vinyl chloride media, fluorescent media, and reflective media up to 0.25 mm thick, high reflective media.*5				
Compatible paper for pouncing	Regular paper from 0.06 to 0.13 mm thick				
Interfaces	USB2.0 (Full Speed)/Network (Ethernet 10BASE-T/100BASE-TX)/RS-232C (Auto switching)				
Buffer memory	2 MB				
Resident command sets	GP-GL/HP-GL(Control panel switching)				
LCD Panel	Graphic type (Yellow backlight)				
Power supply	100-240VAC/50-60 Hz (Auto switching)				
Power consumption	160VA max.				
Operating environment	Temperature: +10˚C to +35˚C Humidity: 35% to 75% (non-condensing)				
Guaranteed accuracy environment	Temperature: +16 ˚C to +32 ˚C Humidity: 35% to 70%(non-condensing)				
External dimensions (W x H x D)	1120 x 1219 x 715 mm	1270 x 1219 x 715 mm	1570 x1219 x 715 mm	1870 x 1219 x 715 mm	2130 x 1219x 715 mm
Weight	36 kg	39 kg	43 kg	51 kg	59 kg

*1 When the optional basket and Graphtec-specified media are used.

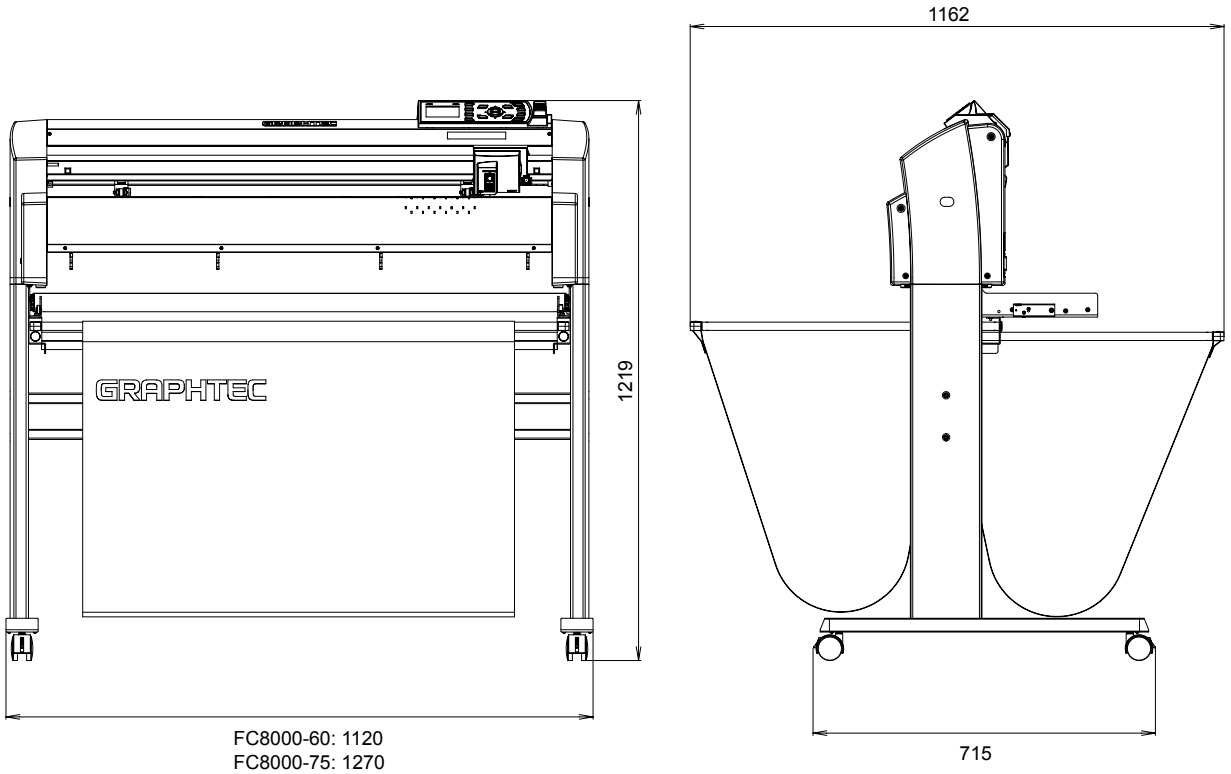
*2 HP-GL is a registered trademark of Hewlett-Packard Company.

*3 The 2-pen unit is a factory-installed option. It cannot be retrofitted.

*4 The PPA32-TP12 pouncing pen cannot be used.

*5 The CB15UA cutter blade and a reinforced backing sheet must be used when cutting high-intensity reflective film.

1.2 External Dimensions



FC8000-60: 1120
FC8000-75: 1270
FC8000-100: 1570
FC8000-130: 1870
FC8000-160: 2130

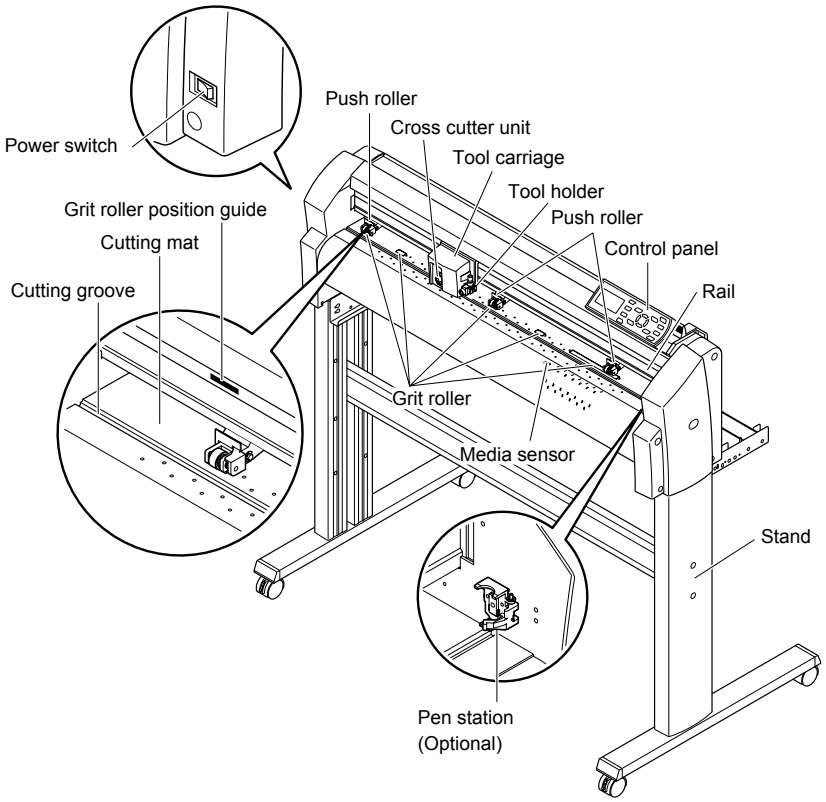
Units: mm

Dimensional accuracy: ±5 mm

2. PARTS NAMES and FUNCTIONS

2.1 Parts Names and Functions

Front View



Power switch: ..... Used to turn the plotter on and off.

Control panel: ..... Used to access various plotter functions.

Pinch rollers: ..... Rollers that push the media against the grit rollers.

Grit rollers: ..... Metallic rollers with a file-like surface that feed the media back and forth.

Media sensors: ..... The front sensor is used to sense the leading edge of the media. The rear sensor is used to sense the trailing edge of the media.

Tool carriage: ..... Moves the cutter-pen or plotting pen across the media during cutting or plotting.

Tool holder: ..... Holds the cutter-pen or plotting pen and moves it up or down.

Pen station (installed on 2-pen models only):

The second pen is mounted here. (Factory-installed option)

Stand: ..... Used to make the plotter more portable and to free up counter space.

Grit roller position guide:

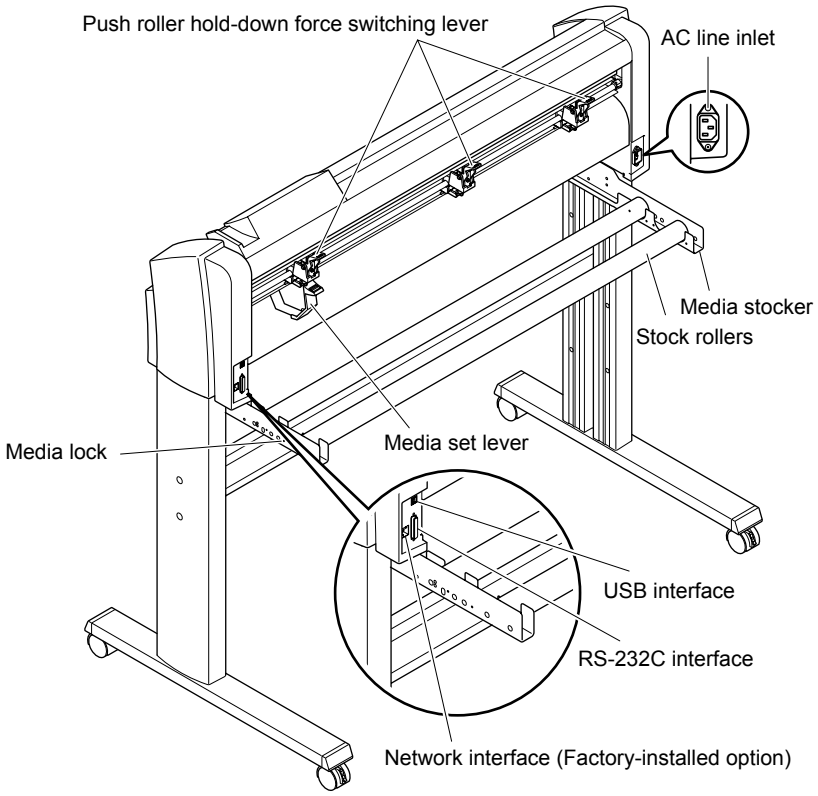
Stickers on the front of the Y rail and the rear side of the top cover that show the position of each grit roller. Use these alignment marks as an aid in locating the pinch rollers.

Cutting mat: ..... Cutter blade moved on this mat, preventing wears of the blade.

Cutting groove: ..... Used when cross-cutting is performed.

Cross-cutter unit: ..... Used to perform cross-cutting of media so that the cut length can be removed from the roll.

Rear View



Media set lever: ..... Used to raise or lower the pinch rollers during the loading or unloading of media.

Pinch roller hold-down force switching lever:

..... Used to switch between the three pinch roller forces (outside push rollers only has 2 forces of strong and medium).

AC line inlet: ..... Inlet where the power cord is connected.

Media stocker: ..... Used to carry roll media and ensure its proper rotation.

Stock rollers:..... A media roll is placed on these rollers.

Media lock: ..... Used to prevent the stock rollers from rotating when the media roll has been placed on top of them. The media lock ensures that the media is pulled straight out from the roll.

USB interface connector:

..... Used to connect the plotter to the computer with a USB interface cable.

Network interface connector:

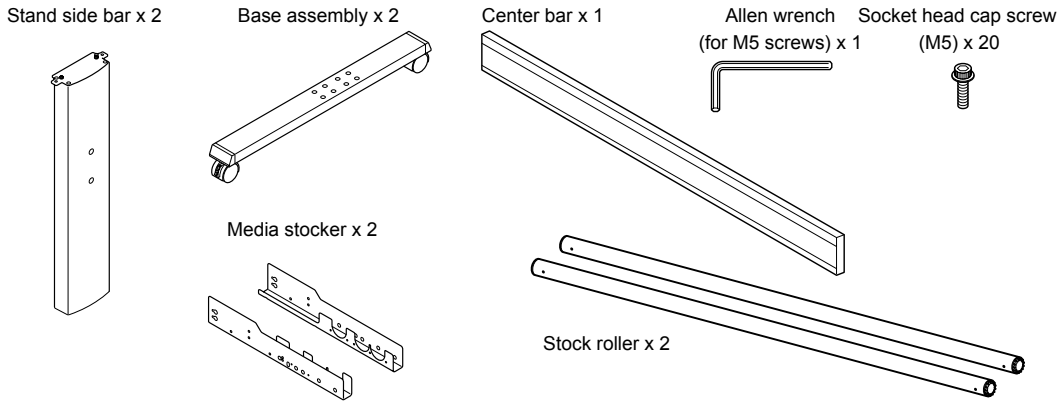
..... Used to connect the plotter to the computer with a network interface cable. (Factory-installed option)

RS-232C interface connector:

..... Used to connect the plotter to the computer with an RS-232 serial interface cable.

2.2 Assembling

Assemble the stand.



Front Loading and Rear Loading

It is necessary to set the loading settings from the plotter control panel depending on the attachment direction.

Default factory setup is set as rear loading.

It is recommended to use as rear loading.

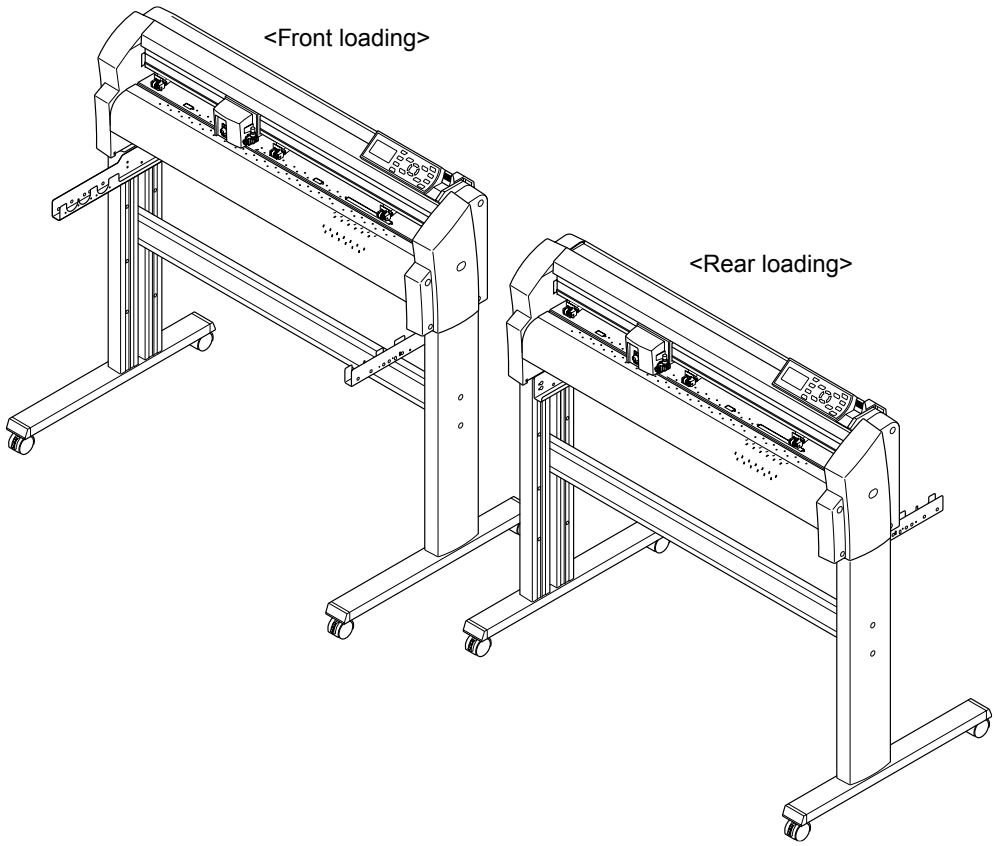
If you desire to load the material from the front, it is also possible to use the front loading.

Use the plotter with enough space behind in this case.

Also, be aware that continuous cutting with cross cut is not possible.

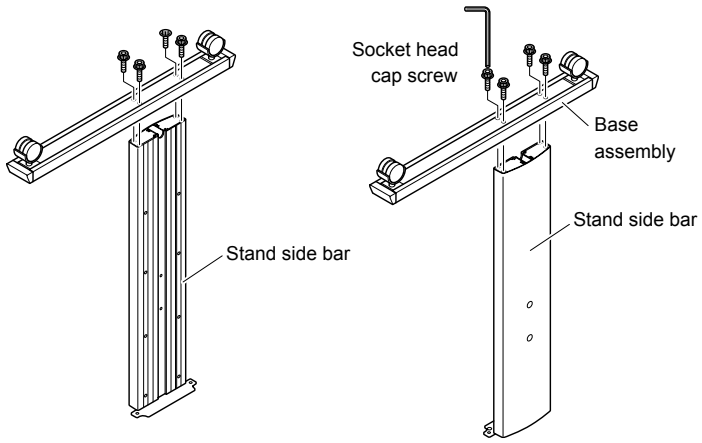
Assembling the Stand

The mounting direction is different for the front loading and the rear loading models.

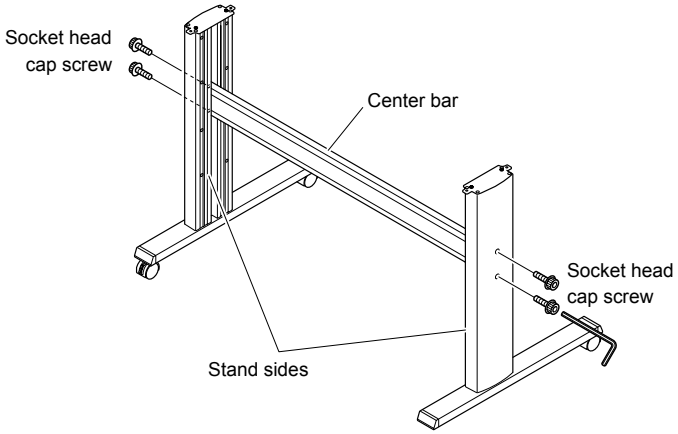


Assembly

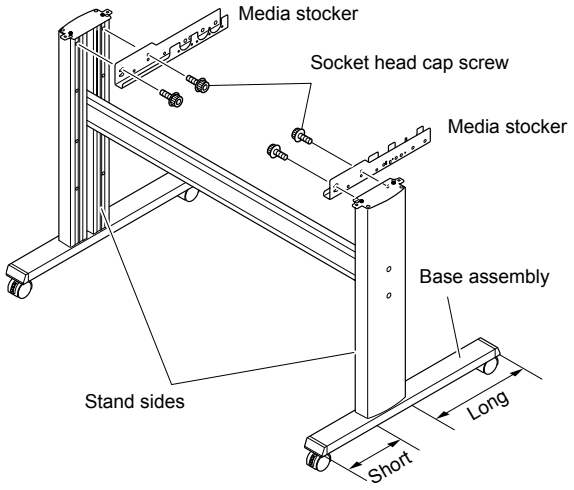
(1) Assemble the left and right stand sides. Fasten a base assembly to each of the stand side bars with four socket head cap screws using the Allen wrench.



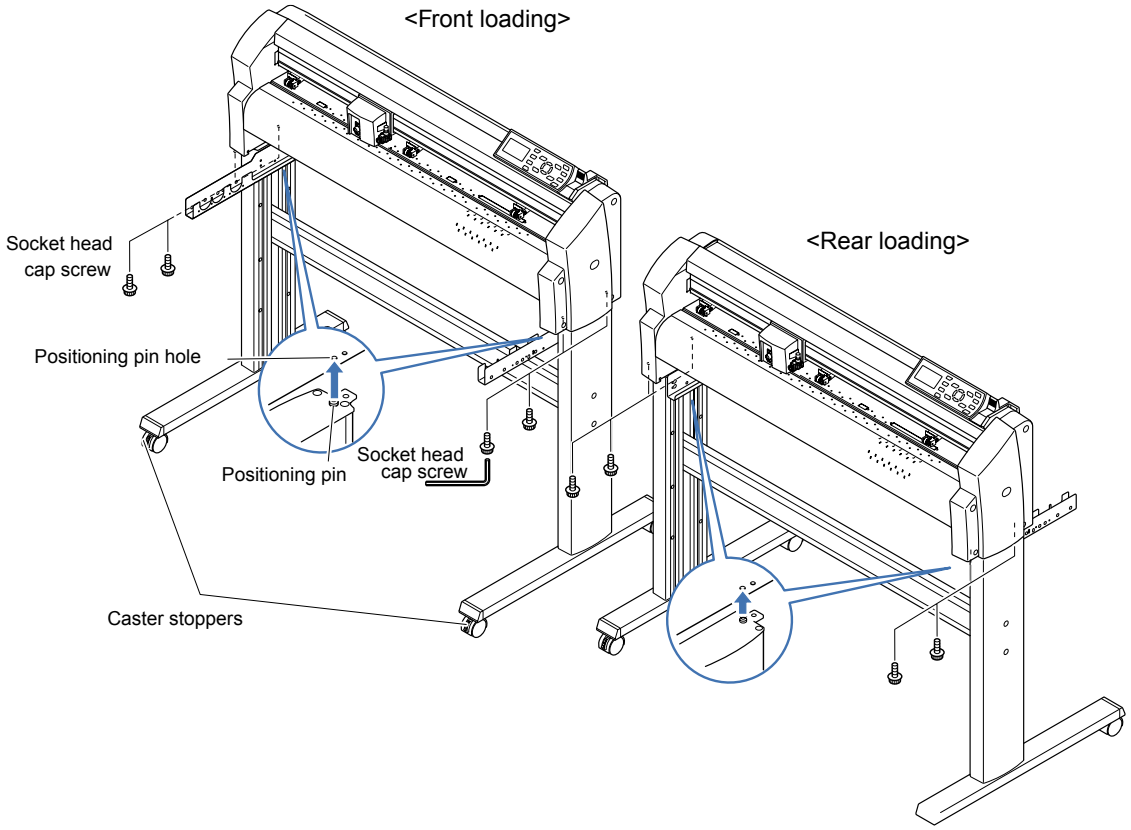
(2) Loosely fasten the center bar to the left and right stand sides with four socket head cap screws (two on each side), using the Allen wrench.



(3) Attach a media stocker to each of the left and right stand sides with two socket head cap screws, using the Allen wrench. Mount the media stockers so that each one protrudes directly above the longer of the two base assembly lengths.



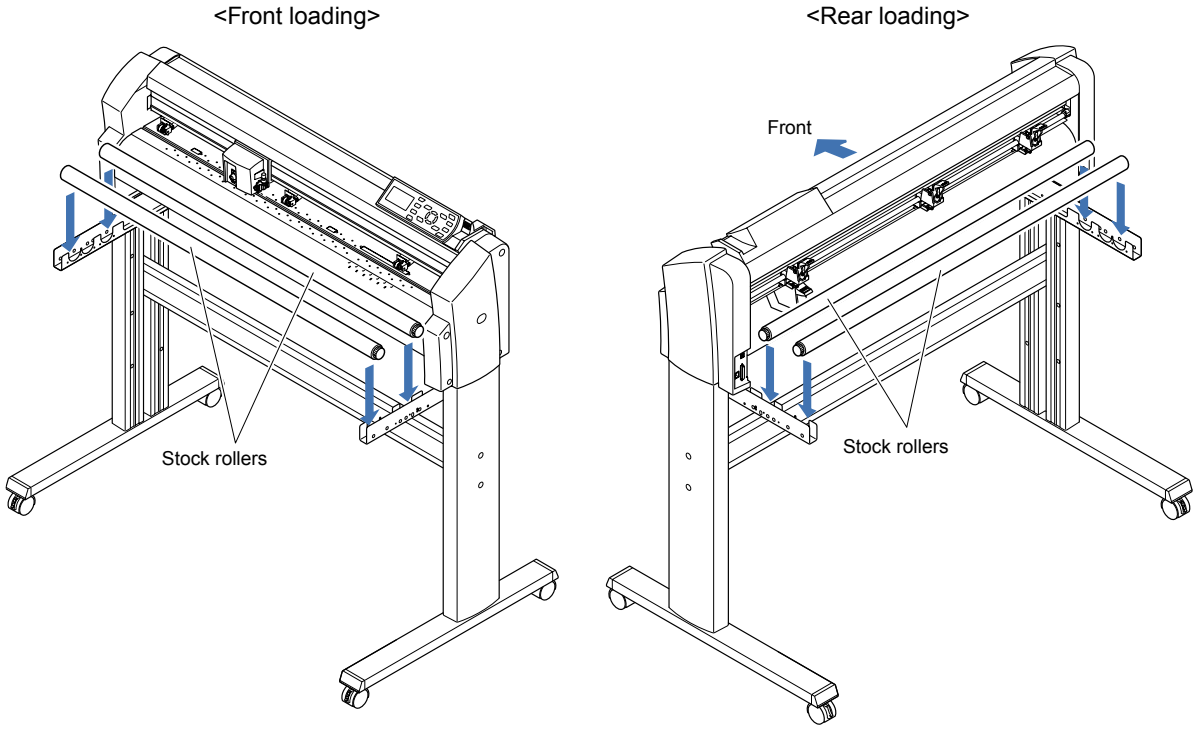
(4) Mount the plotter on the stand by inserting the positioning pins on the stand into the positioning holes on the underside of the plotter. Fasten with four socket head cap screws (two on each side), using the Allen wrench. The cutting plotter mounting direction is different for the front loading and the rear loading models.



(5) Tighten the socket head cap screws loosely fastened in Step 2.

Mounting the stock rollers

Insert the stock rollers into the slots on the media stocker brackets.



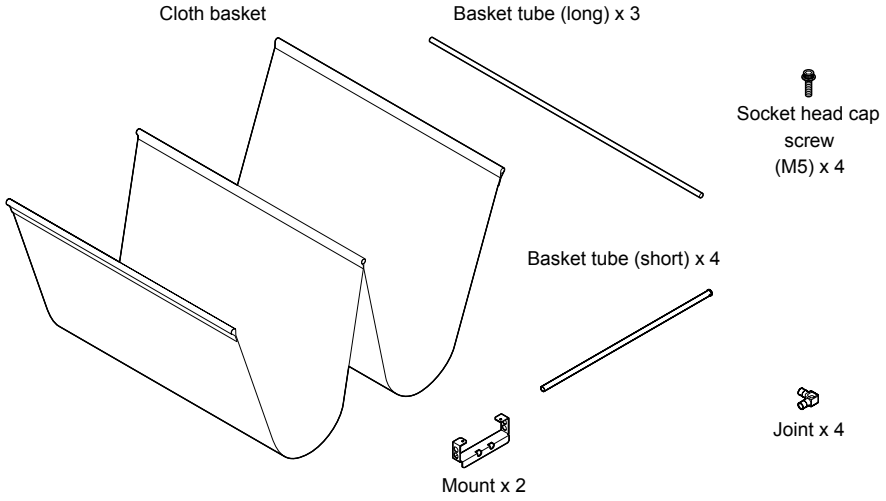
Attaching the Basket

The basket is attached directly to the plotter.

The basket is made up of the following parts.

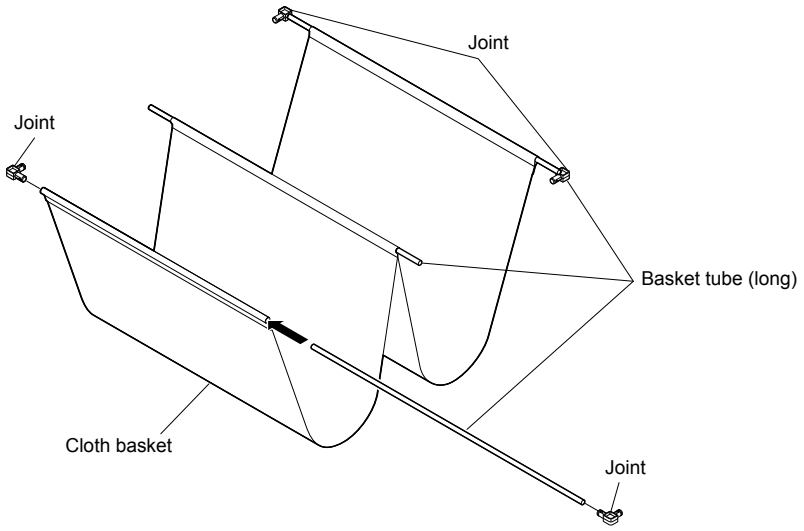
Basket x 1, basket tubes (long) x 3, basket tubes (short) x 4, joints x 4, mounts x 2, socket cap head screws x 4, use Allen wrench to assemble the basket.

Be sure to use the basket when cutting long-axis media of more than 1 meter is to be produced.

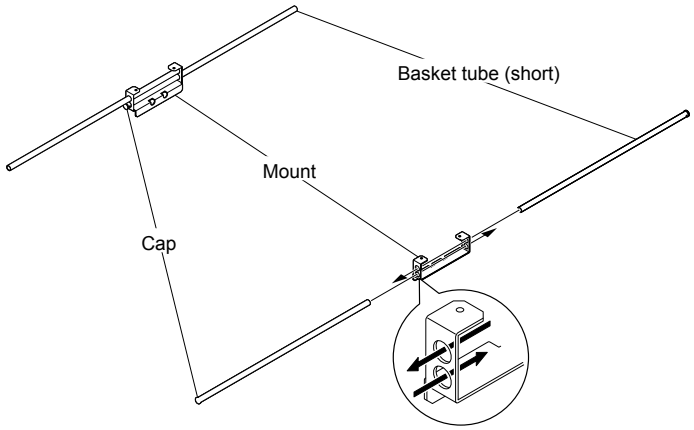


Assembly

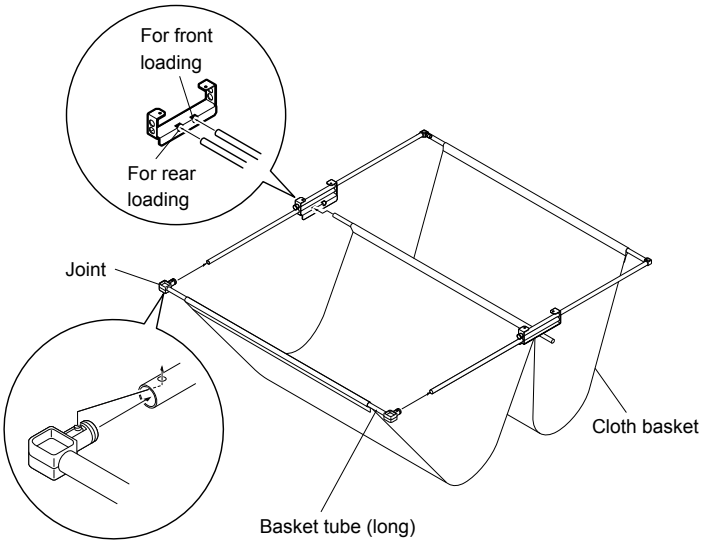
(1) Insert the basket tubes (long) into both ends and center of the basket. Attach the joints to the end of the 2 outside basket tubes.



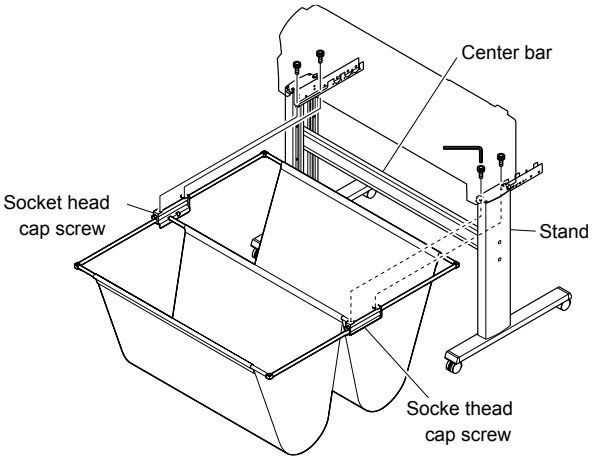
(2) Insert 2 basket tubes (short) into the mount from the side without the cap. Assemble 2 sets as shown below.



(3) Connect the basket tubes (short) to the joints inserted on the basket tubes (long) at the end of the basket attached in step 1.
Mounting position of the center basket pipe (long) depends on the loading direction.



(4) Fix the part assembled in 3 to the stand using the socket head cap screws. Assembly is completed by separating basket to front and back of the center bar.



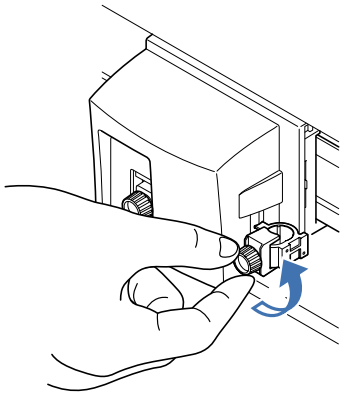
2.3 Attaching a Tool

Attach a tool (cutter pen, plotter pen) to the plotter.

Attaching a Tool

When mounting the tool in the tool holder, push the tool all the way into the holder until its flange contacts the upper part of the holder and then tighten the screw firmly. To prevent injury, avoid touching the tool immediately after the cutting plotter is turned on or whenever the tool is moving. It is explained here using cutter pen as anexample.

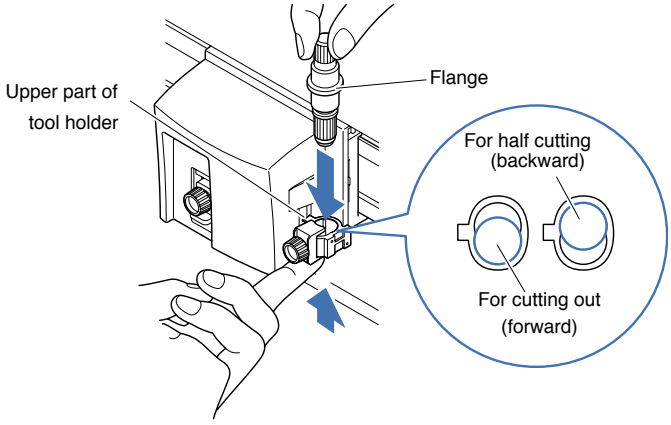
(1) Loosen the pen holder screw.



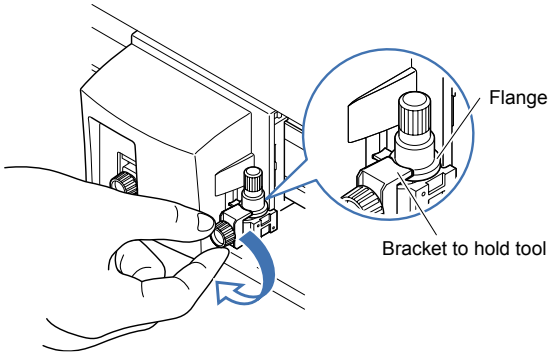
(2) While pushing the tool holder in the upward direction, push the tool all the way into the holder until its flange contacts the upper part of the holder.

CHECKPOINT

• When pushing the tool holder with your fingers, the blade tip may be protruding. Take care not to cut your fingers.



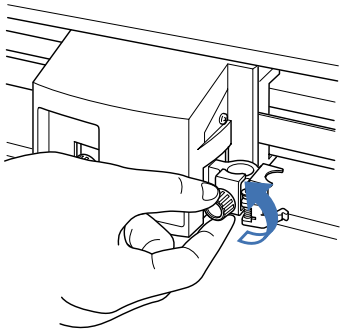
(3) Make sure that the tool bracket is engaged on the tool's flange, and then tighten the screw.



Attaching a Pen to the Two-Pen Holder (Option)

The two-pen holder is a factory-installed option, and cannot be retrofitted.

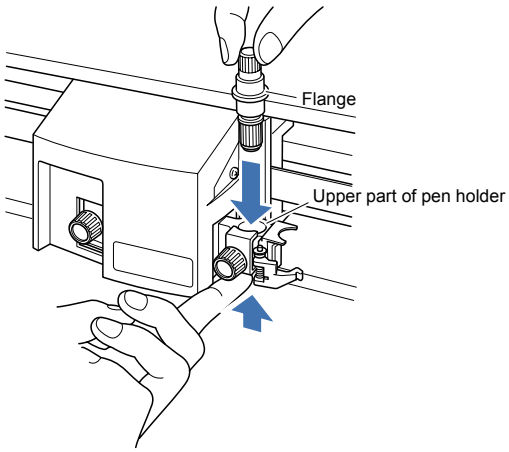
(1) Loosen the pen holder screw.



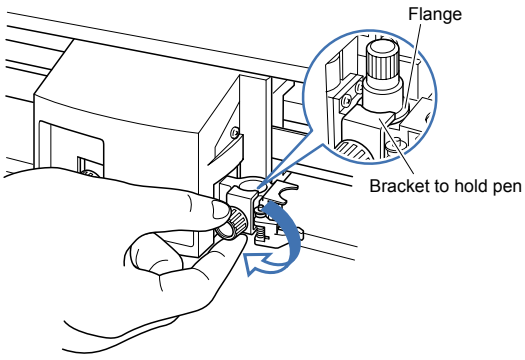
(2) While pushing the pen holder in the upward direction, push the pen all the way into the holder until its flange contacts the upper part of the holder.

CHECKPOINT

• When you push the pen holder with your fingers, the blade tip may be protruding. Take care not to cut your fingers.

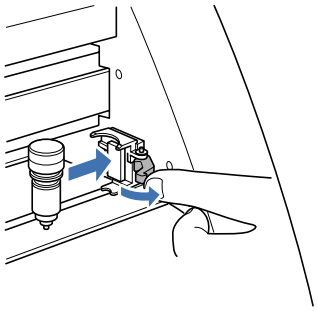


(3) Make sure that the pen bracket is engaged on the pen's flange, and then tighten the screw.

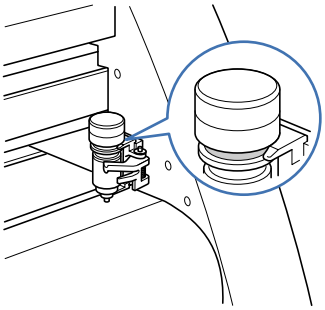


Attaching a Plotting Pen to the Pen Station

(1) Open the pen-hold mechanism on the pen station, and then attach a pen.



(2) Make sure that the bracket of the pen station is engaged in the upper groove of the pen.



(3) Close the pen-hold mechanism on the pen station to hold the pen in place.

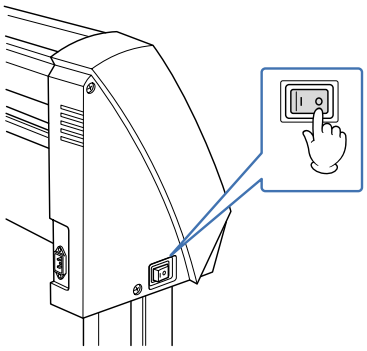
CHECKPOINT

- Do not leave a pen attached to the pen station for a long period of time, as the pen tip will dry up and make it unusable.
- To store the pen, remove it from the pen station and replace its protective cap.

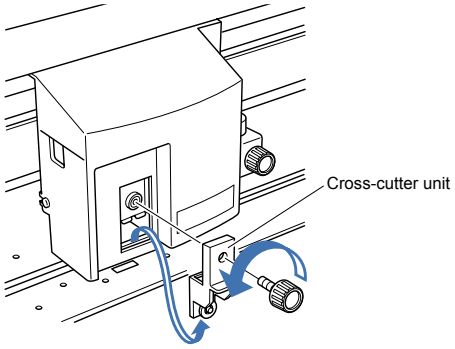
2.4 Replacing the Cross-Cutter Unit

Follow the procedure below to replace the cross-cutter unit that is used to cut the media after the plotting or cutting operation has been completed.

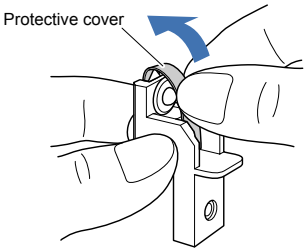
(1) Check that the power switch is turned off (the “O“ side is pressed down).



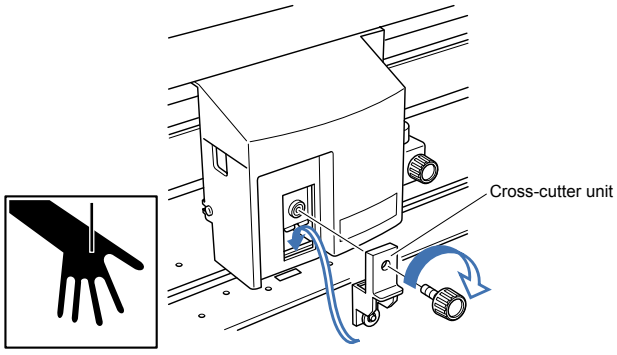
(2) Remove the screw holding the cross-cutter unit in place, and then remove the cross-cutter unit.



(3) Remove the protective cover from the replacement cross-cutter unit. Be sure to remove the protective cover while holding the part of the unit shown in the figure below.



(4) Attach the replacement cross-cutter unit, and tighten the screw to hold it in place.

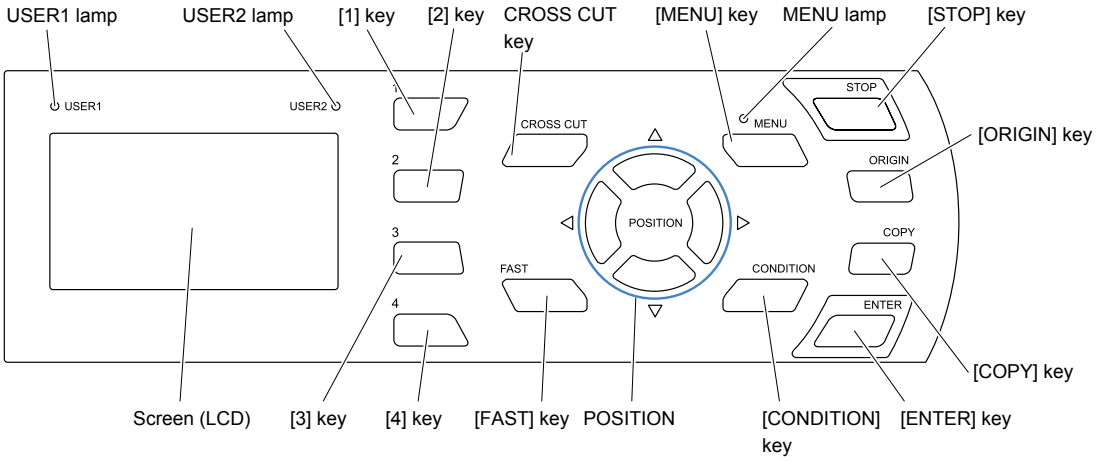


WARNING: The cross-cutter unit uses a very sharp blade. Take care not to cut yourself on the blade.

3. OPERATIONS

3.1 Control Panel

This section explains the function of lamps and keys on the control panel.



Control Keys

POSITION keys..... There are following functions depending on the operation. Move the tool carriage and media. It will move specified distance when it is pressed once,and continuously move when it is pressed down. It will select the menu when UP, DOWN, LEFT or RIGHT arrow keys are displayed in the menu on the screen.

FAST..... The tool carriage or the media will move faster when it is pressed simultaneously with POSITION key. It will work as a menu key when it is displaying “F” on the screen.

CROSS CUT ..... It will cut off the media that has finished cutting.

STOP..... Cutting operation will stop immediately when the [STOP] key is pressed while cutting.

You can reset the media by pressing the [STOP] key while cutting when the media has shifted.

ORIGIN..... It will set the current position as an origin point.

The plotter is reset by pressing the [ENTER] key and the [ORIGIN] key simultaneously in the first screen of the MENU mode (MENU screen).

Menu Keys

MENU..... It will switch to the MENU mode. MENU lamp is lit in the MENU mode.

It will go into MENU mode if it is pressed once, and MENU mode will be turned off when it is pressed again.

Different function are set in the MENU mode.

Data received while in the MENU mode will be stored in the data buffer.

CONDITION ..... It will display the screen to set the tool conditions.

1, 2, 3, 4 ..... Select the menu number displayed in the screen.

ENTER ..... It will define the settings. The plotter is reset by pressing the [ORIGIN] key and this key simultaneously in the first screen of the MENU mode (MENU screen). It will display current cutting area when the [ENTER] key is pressed in READY status.

Indicator Lamps

MENU lamp ..... Green lamp is lit while in MENU mode.

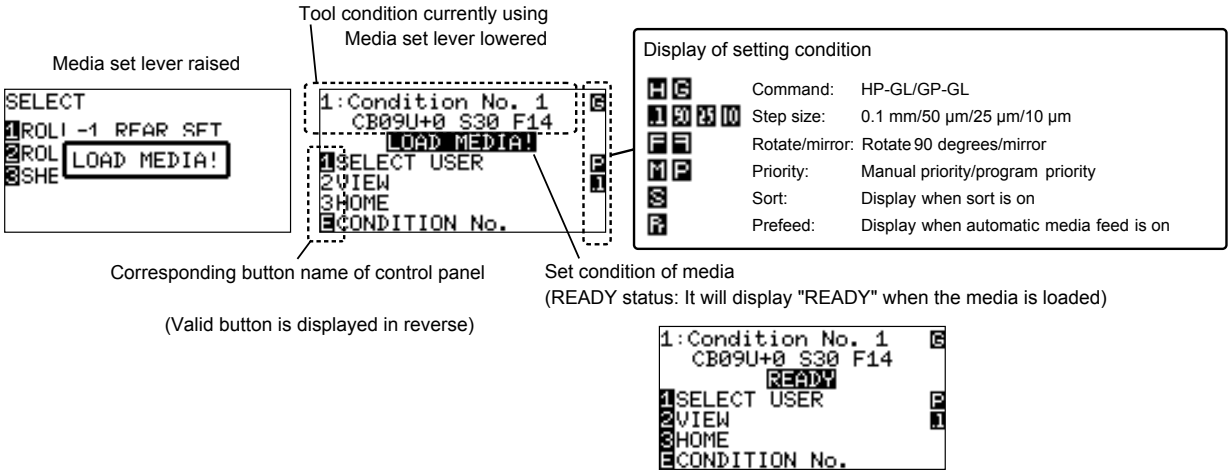
USER 1, 2 lamp..... The lamp for selected user will lit.
The lamp is lit when the user priority is set to “Key, Controller”. It will flash when it is set to “Key only”.

3.2 Reading the Screen (LCD)

Information reflecting the status will be displayed in the screen of the control panel.

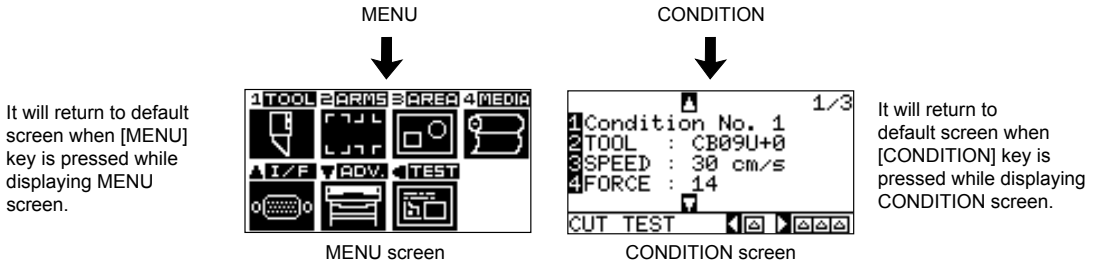
Name of the button and corresponding function is displayed on the screen when a function is allocated to the button on the control panel. Button name will be displayed in reverse when the button is enabled.

Following items are displayed in the default screen.



Display of Default Screen

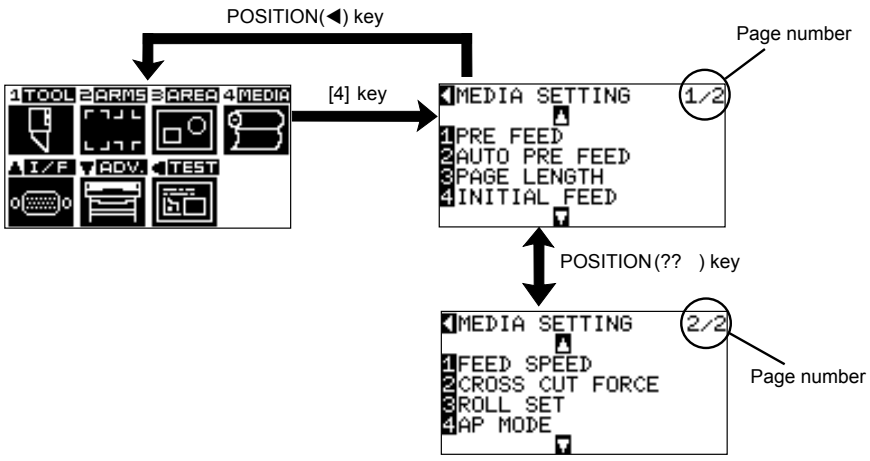
Screen to set the corresponding conditions is displayed when the [MENU] key or [CONDITION] key are pressed.



MENU screen displayed by button operation

Page number is displayed in the upper right corner of the screen if there are too many settings or selection that will need multiple pages to display.

Press the position (▲▼) key to move different page.



Example of moving page and operation button

Icon of the corresponding operation button is displayed in the screen to change the setting values.

Increase or decrease the setting value using POSITION (▲▼) key. Select the change unit by [FAST] key.

Select the setting by number keys (1, 2, 3, 4) or POSITION (▲▼◀▶) keys.

Example of screen to change the settings value

Contents of Operation from Menu Screen

MENU screen

Contents of the operation and settings that is displayed in MENU screen with [MENU] key is as following:

[1] (TOOL): ..... Make the setting for the operation of the tool.

[2] (ARMS):..... Make the settings and operation to position the tool and media, such as automatic scanning of the registration marks by the ARMS.

[3] (AREA): ..... Make the settings for area, magnification, rotation, reverse, etc., of the cutting.

[4] (MEDIA): .... Make the setting of the condition for the media.

[▲] (I/F): ..... Make the settings of the condition for the interfacing with the control computer.

[▼] (ADV): ..... Make the settings of the conditions for the basic operation of the plotter, such as display language, unit of the measurements, sensor, etc.

[◀] (TEST):..... Does the operation necessary for maintenance, such as self diagnostic test or printout of the condition settings list.

MENU:..... It will close the MENU screen and return to default screen.

Contents of Operation from CONDITION Key

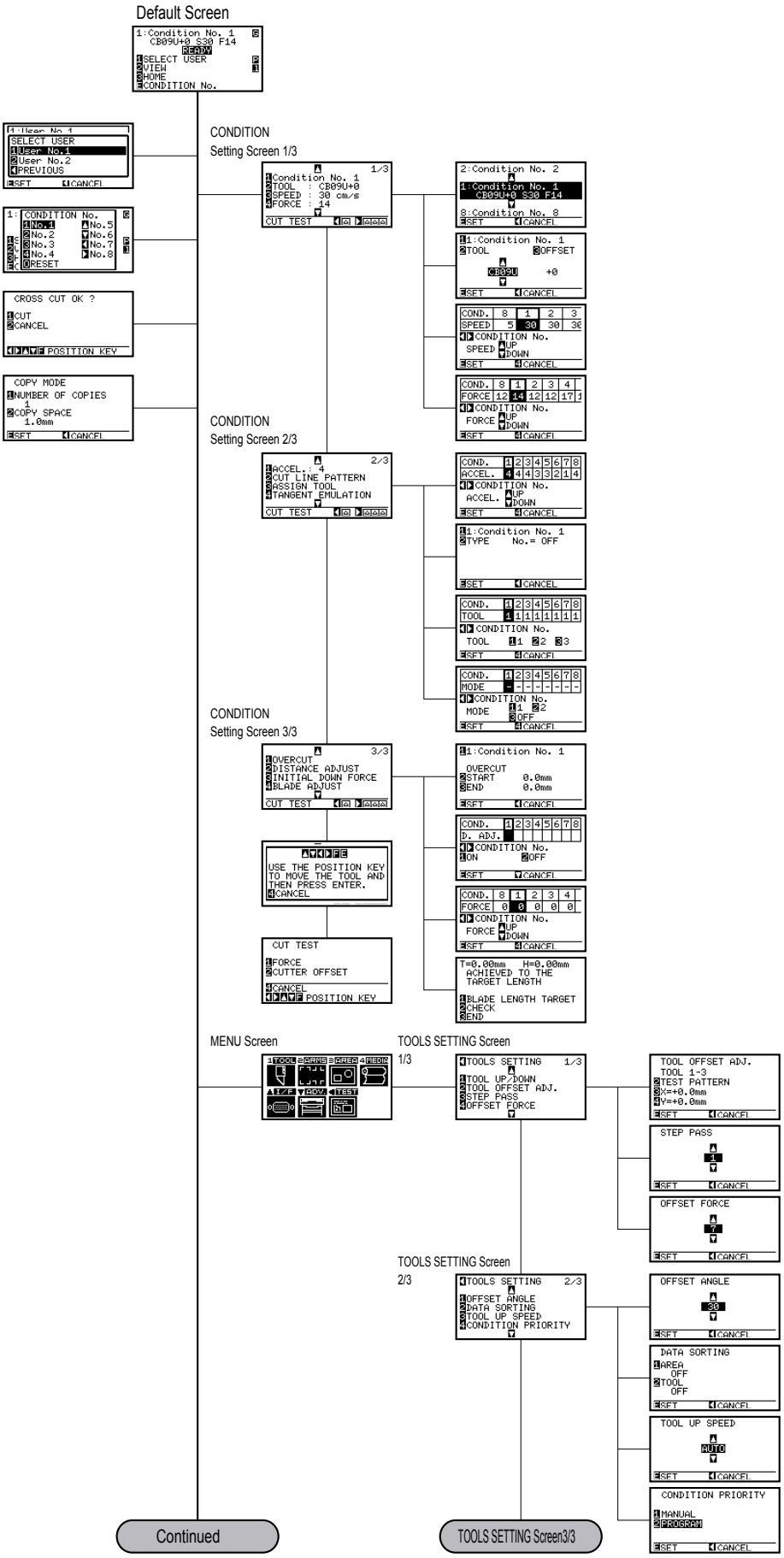
CONDITION screen (1-3)

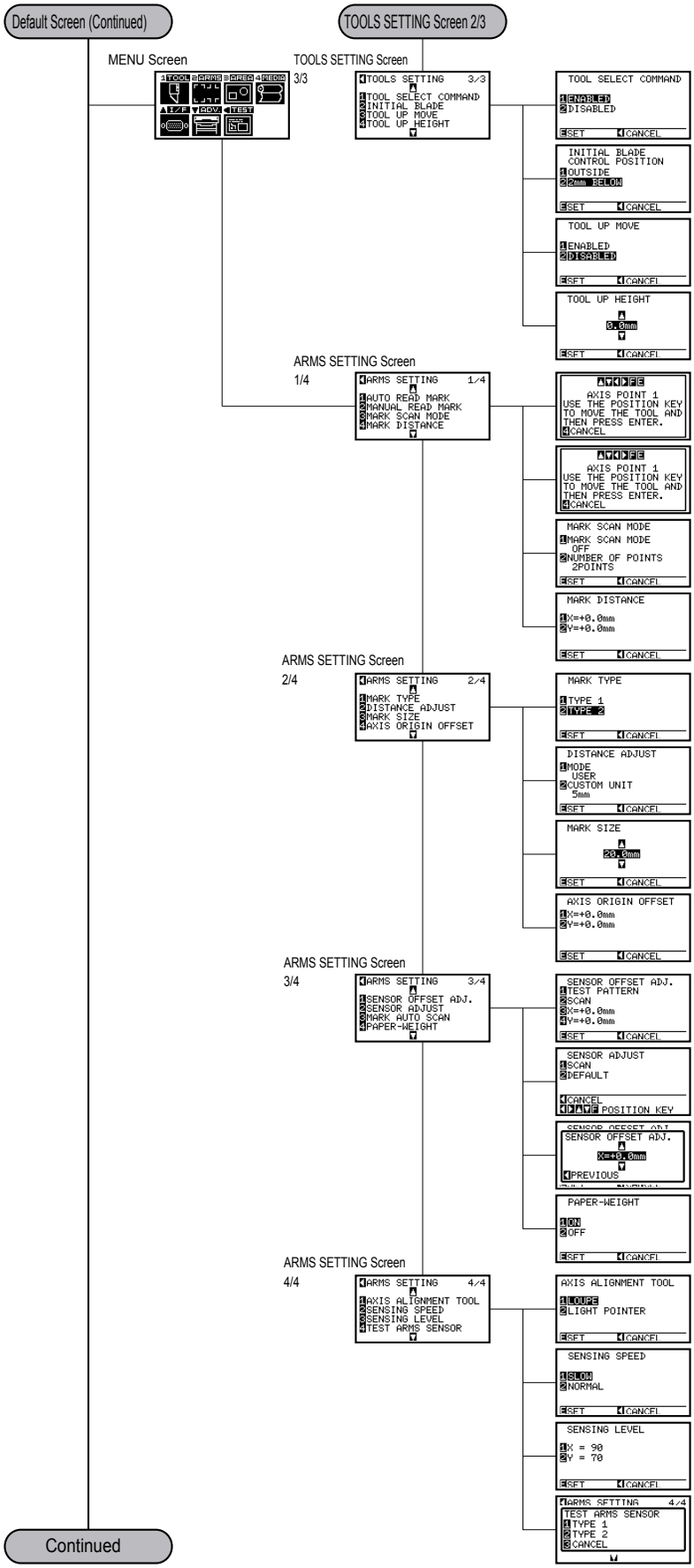
Tool conditions are set in the setting screens displayed by the [CONDITION] key.

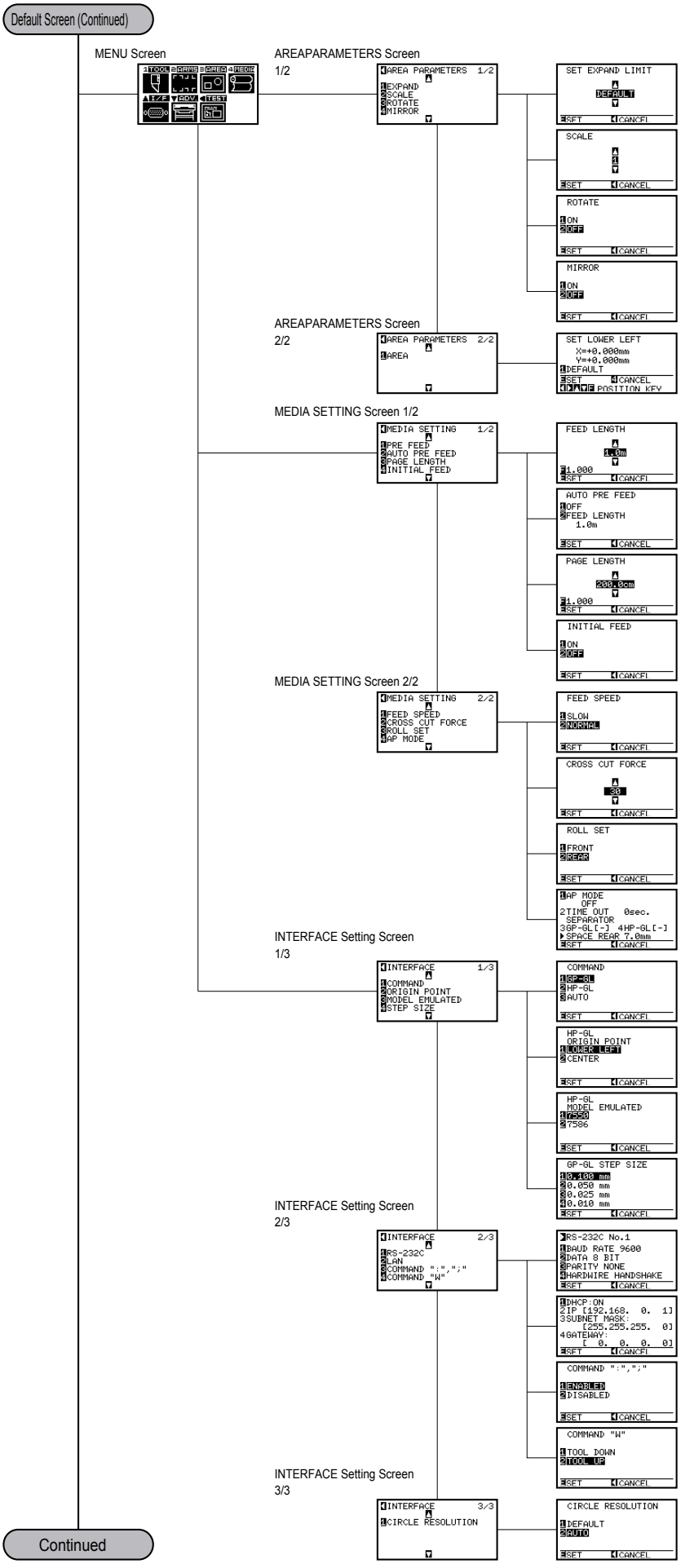
Up to 8 CONDITION settings can be saved with different settings in numbers 1 through 8.

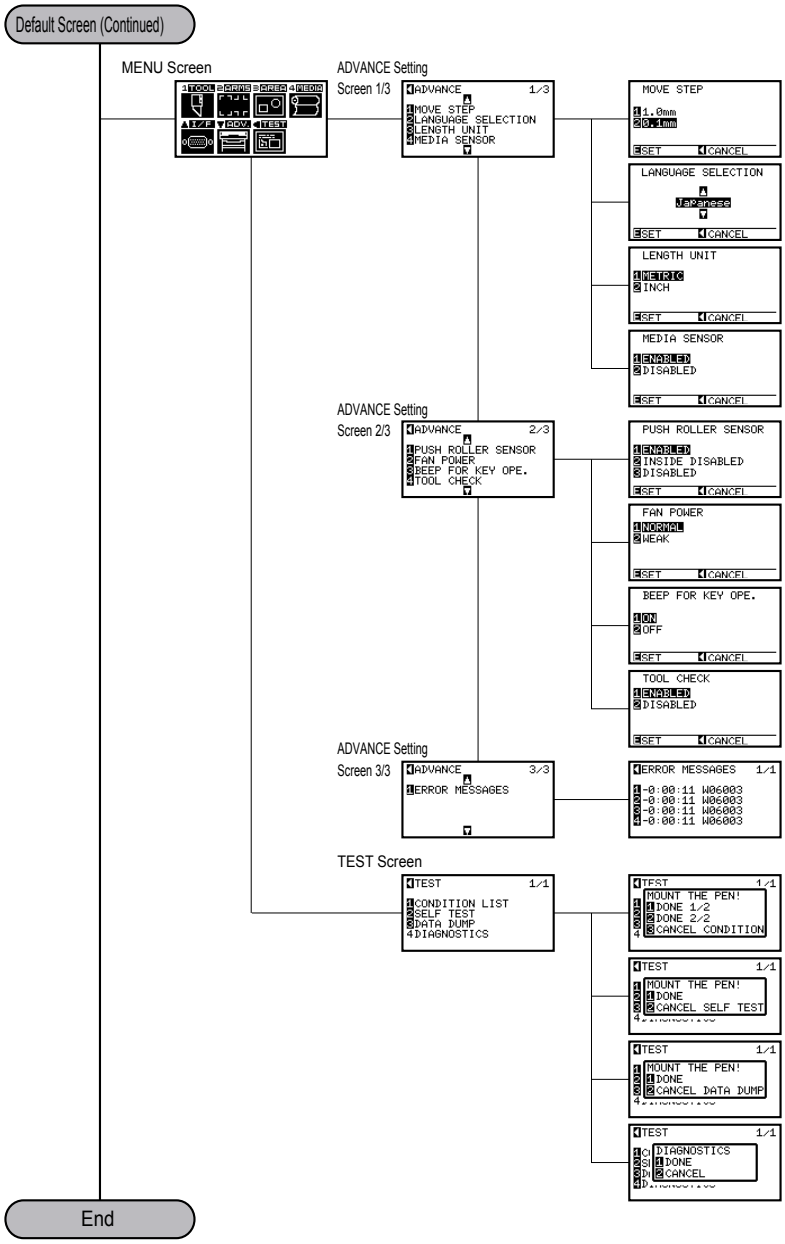
CONDITION: It will clear the CONDITION screen and return to default screen.

Menu tree


Default Screen
1:Condition No. 1
CB09U+0 S30 F14
READY
1SELECT USER
2VIEW
3HOME
4CONDITION No.
SELECT USER
1User No.1
2User No.2
3PREVIOUS
CONDITION
Setting Screen 1/3
Condition No. 1
TOOL : CB09U+0
SPEED : 30 cm/s
FORCE : 14
CUT TEST
2:Condition No. 2
1:Condition No. 1
CB09U+0 S30 F14
8:Condition No. 8
CONDITION No.
No.1
No.2
No.3
No.4
No.5
No.6
No.7
No.8
RESET
CROSS CUT OK ?
1CUT
2CANCEL
POSITION KEY
COPY MODE
1NUMBER OF COPIES
1
2COPY SPACE
1.0mm
1:Condition No. 1
2TOOL
3OFFSET
CB09U
+0
COND. 8 1 2 3
SPEED 5 30 30 30
CONDITION No.
SPEED UP DOWN
FORCE 12 14 12 12 17
FORCE UP DOWN
CONDITION
Setting Screen 2/3
ACCEL. 4
1CUT LINE PATTERN
2ASSIGN TOOL
3TANGENT EMULATION
ACCEL. 4 4 4 3 3 2 1 4
1:Condition No. 1
2TYPE No.= OFF
TOOL 1 1 1 1 1 1 1 1
TOOL 1 2 3
MODE - - - - - - - -
MODE 1 2
3OFF
CONDITION
Setting Screen 3/3
OVERCUT
DISTANCE ADJUST
INITIAL DOWN FORCE
BLADE ADJUST
1:Condition No. 1
OVERCUT
2START 0.0mm
3END 0.0mm
D. ADJ.
1ON 2OFF
FORCE 0 0 0 0 0
USE THE POSITION KEY TO MOVE THE TOOL AND THEN PRESS ENTER.
4CANCEL
CUT TEST
1FORCE
2CUTTER OFFSET
4CANCEL
POSITION KEY
T=0.00mm H=0.00mm
ACHIEVED TO THE TARGET LENGTH
1BLADE LENGTH TARGET CHECK
3END
MENU Screen
TOOLS SETTING Screen
1/3
TOOLS SETTING 1/3
1TOOL UP/DOWN
2TOOL OFFSET ADJ.
3STEP PASS
4OFFSET FORCE
TOOL OFFSET ADJ.
TOOL 1-3
1TEST PATTERN
2X=+0.0mm
3Y=+0.0mm
STEP PASS
OFFSET FORCE
TOOLS SETTING Screen
2/3
TOOLS SETTING 2/3
1OFFSET ANGLE
2DATA SORTING
3TOOL UP SPEED
4CONDITION PRIORITY
OFFSET ANGLE
30
DATA SORTING
1AREA
OFF
2TOOL
OFF
TOOL UP SPEED
AUTO
CONDITION PRIORITY
1MANUAL
2PROGRAM
Continued
TOOLS SETTING Screen3/3


Default Screen (Continued)
TOOLS SETTING Screen 2/3
MENU Screen
TOOLS SETTING Screen 3/3
TOOLS SETTING 3/3
1 TOOL SELECT COMMAND
2 INITIAL BLADE
3 TOOL UP MOVE
4 TOOL UP HEIGHT
TOOL SELECT COMMAND
1 ENABLED
2 DISABLED
SET CANCEL
INITIAL BLADE CONTROL POSITION
1 OUTSIDE
2 2mm BELOW
SET CANCEL
TOOL UP MOVE
1 ENABLED
2 DISABLED
SET CANCEL
TOOL UP HEIGHT
0.0mm
SET CANCEL
ARMS SETTING Screen 1/4
ARMS SETTING 1/4
1 AUTO READ MARK
2 MANUAL READ MARK
3 MARK SCAN MODE
4 MARK DISTANCE
AXIS POINT 1
USE THE POSITION KEY TO MOVE THE TOOL AND THEN PRESS ENTER.
4 CANCEL
AXIS POINT 1
USE THE POSITION KEY TO MOVE THE TOOL AND THEN PRESS ENTER.
4 CANCEL
MARK SCAN MODE
1 MARK SCAN MODE OFF
2 NUMBER OF POINTS 2POINTS
SET CANCEL
MARK DISTANCE
1 X=+0.0mm
2 Y=+0.0mm
SET CANCEL
ARMS SETTING Screen 2/4
ARMS SETTING 2/4
1 MARK TYPE
2 DISTANCE ADJUST
3 MARK SIZE
4 AXIS ORIGIN OFFSET
MARK TYPE
1 TYPE 1
2 TYPE 2
SET CANCEL
DISTANCE ADJUST
1 MODE USER
2 CUSTOM UNIT 5mm
SET CANCEL
MARK SIZE
20.0mm
SET CANCEL
AXIS ORIGIN OFFSET
1 X=+0.0mm
2 Y=+0.0mm
SET CANCEL
ARMS SETTING Screen 3/4
ARMS SETTING 3/4
1 SENSOR OFFSET ADJ.
2 SENSOR ADJUST
3 MARK AUTO SCAN
4 PAPER-WEIGHT
SENSOR OFFSET ADJ.
1 TEST PATTERN
2 SCAN
3 X=+0.0mm
4 Y=+0.0mm
SET CANCEL
SENSOR ADJUST
1 SCAN
2 DEFAULT
CANCEL
POSITION KEY
SENSOR OFFSET ADJ.
X=+0.0mm
PREVIOUS
PAPER-WEIGHT
1 ON
2 OFF
SET CANCEL
ARMS SETTING Screen 4/4
ARMS SETTING 4/4
1 AXIS ALIGNMENT TOOL
2 SENSING SPEED
3 SENSING LEVEL
4 TEST ARMS SENSOR
AXIS ALIGNMENT TOOL
1 LOUPE
2 LIGHT POINTER
SET CANCEL
SENSING SPEED
1 SLOW
2 NORMAL
SET CANCEL
SENSING LEVEL
1 X = 90
2 Y = 70
SET CANCEL
ARMS SETTING 4/4
TEST ARMS SENSOR
1 TYPE 1
2 TYPE 2
3 CANCEL
Continued


Default Screen (Continued)
MENU Screen
AREAPARAMETERS Screen 1/2
AREA PARAMETERS 1/2
1EXPAND
2SCALE
3ROTATE
4MIRROR
SET EXPAND LIMIT
DEFAULT
SET
CANCEL
SCALE
1
ROTATE
1ON
2OFF
MIRROR
AREAPARAMETERS Screen 2/2
AREA PARAMETERS 2/2
1AREA
SET LOWER LEFT
X=+0.000mm
Y=+0.000mm
1DEFAULT
POSITION KEY
MEDIA SETTING Screen 1/2
MEDIA SETTING 1/2
1PRE FEED
2AUTO PRE FEED
3PAGE LENGTH
4INITIAL FEED
FEED LENGTH
1.0m
1.000
AUTO PRE FEED
1OFF
2FEED LENGTH
1.0m
PAGE LENGTH
200.0cm
INITIAL FEED
MEDIA SETTING Screen 2/2
MEDIA SETTING 2/2
1FEED SPEED
2CROSS CUT FORCE
3ROLL SET
4AP MODE
FEED SPEED
1SLOW
2NORMAL
CROSS CUT FORCE
30
ROLL SET
1FRONT
2REAR
1AP MODE
OFF
2TIME OUT 0sec.
SEPARATOR
3GP-GL[-] 4HP-GL[-]
SPACE REAR 7.0mm
INTERFACE Setting Screen 1/3
INTERFACE 1/3
1COMMAND
2ORIGIN POINT
3MODEL EMULATED
4STEP SIZE
COMMAND
1GP-GL
2HP-GL
3AUTO
HP-GL
ORIGIN POINT
1LOWER LEFT
2CENTER
HP-GL
MODEL EMULATED
1HP550
27586
GP-GL STEP SIZE
10.100 mm
20.050 mm
30.025 mm
40.010 mm
INTERFACE Setting Screen 2/3
INTERFACE 2/3
1RS-232C
2LAN
3COMMAND ":","."
4COMMAND "W"
RS-232C No.1
1BAUD RATE 9600
2DATA 8 BIT
3PARITY NONE
4HARDWIRE HANDSHAKE
1DHCP:ON
2IP [192.168. 0. 1]
3SUBNET MASK:
[255.255.255. 0]
4GATEWAY:
[0. 0. 0. 0]
COMMAND ":","."
1ENABLED
2DISABLED
COMMAND "W"
1TOOL DOWN
2TOOL UP
INTERFACE Setting Screen 3/3
INTERFACE 3/3
1CIRCLE RESOLUTION
CIRCLE RESOLUTION
1DEFAULT
2AUTO
Continued


Default Screen (Continued)
MENU Screen
ADVANCE Setting
Screen 1/3
ADVANCE 1/3
1MOVE STEP
2LANGUAGE SELECTION
3LENGTH UNIT
4MEDIA SENSOR
MOVE STEP
1 1.0mm
2 0.1mm
#SET CANCEL
LANGUAGE SELECTION
Japanese
#SET CANCEL
LENGTH UNIT
1 METRIC
2 INCH
#SET CANCEL
MEDIA SENSOR
1 ENABLED
2 DISABLED
#SET CANCEL
ADVANCE Setting
Screen 2/3
ADVANCE 2/3
1PUSH ROLLER SENSOR
2FAN POWER
3BEEP FOR KEY OPE.
4TOOL CHECK
PUSH ROLLER SENSOR
1 ENABLED
2 INSIDE DISABLED
3 DISABLED
#SET CANCEL
FAN POWER
1 NORMAL
2 WEAK
#SET CANCEL
BEEP FOR KEY OPE.
1 ON
2 OFF
#SET CANCEL
TOOL CHECK
1 ENABLED
2 DISABLED
#SET CANCEL
ADVANCE Setting
Screen 3/3
ADVANCE 3/3
1ERROR MESSAGES
ERROR MESSAGES 1/1
1 -0:00:11 W06003
2 -0:00:11 W06003
3 -0:00:11 W06003
4 -0:00:11 W06003
TEST Screen
TEST 1/1
1CONDITION LIST
2SELF TEST
3DATA DUMP
4DIAGNOSTICS
TEST 1/1
MOUNT THE PEN!
1 DONE 1/2
2 DONE 2/2
3 CANCEL CONDITION
TEST 1/1
MOUNT THE PEN!
1 DONE
2 CANCEL SELF TEST
TEST 1/1
MOUNT THE PEN!
1 DONE
2 CANCEL DATA DUMP
TEST 1/1
DIAGNOSTICS
1 DONE
2 CANCEL
End

4. RECOMMENDED PARTS LIST

No.	Part No.	Description	-60	-75	-100	-130	-160	Remarks
1	792800700	Main Board	1	1	1	1	1	
2	682140120	Switching Power Supply Unit	1	1	1	1	1	
3	500052478	Cam Sensor, LG-217D-3	1	1	1	1	1	
4	500051382	Media Sensor, PS-117ND-1	2	2	2	2	2	Paper Sensor
5	682126200	Motor, X	1	1	–	–	–	X motor
	682132430	Motor, X	–	–	1	1	1	
6	682126200	Motor, Y	1	1	1	1	1	Y motor
7	792800702	Pen Relay Board	1	1	1	1	1	
8	792800703	Pinch Roller Sensor Board	1	1	1	1	1	
9	792800704	Registration Mark Sensor Board	1	1	1	1	1	
10	792800705	Cam Sensor Board	1	1	1	1	1	
11	792800706	Control Panel Board	1	1	1	1	1	
12	792800707	LAN Board	1	1	1	1	1	Option
13	692140321	Flexible Printed Cable, FPC707102	1	1	1	1	1	Control Panel 20P
14	692140330	Y Flexible Printed Cable, FPC707103, 60/75	1	1	–	–	–	FC8000-60/75
	692140340	Y Flexible Printed Cable, FPC707105	–	–	1	–	–	FC8000-100
	692140350	Y Flexible Printed Cable, FPC707105	–	–	–	1	–	FC8000-130
	692140360	Y Flexible Printed Cable, FPC707106	–	–	–	–	1	FC8000-160
15	692140310	Flexible Printed Cable, FPC707101A	1	1	1	1	1	Control Panel Flexible Cable 16 Pin
16	792800708	Pen Block Assembly (Pen Carriage)	1	1	1	1	1	
17	792800709	Light Pointer Assembly	1	1	1	1	1	
18	500052451	Fan, KLDC12B4-940	1	1	2	2	2	
19	682140130	LCD, JMS12864-15ABAYD	1	1	1	1	1	
20	772126570	Control Panel Baord	1	1	1	1	1	
21	792800711	Cross Cutter Assy	1	1	1	1	1	
22	621391220	Y Belt 60, 150S2M1000	1	–	–	–	–	
	621261220	Y Belt 75, 150S2M-1150	–	1	–	–	–	
	621271220	Y Belt 100, 300S2M-1450	–	–	1	–	–	
	621281220	Y Belt 130, 300S2M-1750	–	–	–	1	–	
	621291220	Y Belt 160, 300S2M-2010	–	–	–	–	1	
23	621392020	Drive Roller set 60	1	–	–	–	–	
	621262020	Drive Roller Set 75	–	1	–	–	–	
	621272020	Drive Roller Set 100	–	–	1	–	–	
	621282020	Drive Roller Set 130	–	–	–	1	–	
	621292020	Drive Roller Set 160	–	–	–	–	1	
24	095002121	Push Roller	2	2	3	3	3	
25	378413041	130TN15-10W, Motor Belt	2	2	2	2	2	
26	095013010	Roller BB13, Y Slider Roller	7	7	7	7	7	
27	621399900	Cutting Mat, 20 m roll	1	1	1	1	1	

5. LIST OF TOOLS

5.1 Tools

No.	Adjustment Item	Jig	Tool
1	Pen force adjustment	Cutter Pen Holder (CB09)	Colex gauge (50,300,500 gf)
2	Distance adjustment		Glass scale
3	Pen block height adjustment	10 mm height block	
4	Firmware update		PC, USB I/F cable
5	X-drive belt tension adjustment		Push-pull gauge (2 kg)
6	Y-drive belt tension adjustment		Push-pull gauge (2 kg)
7	Replacing the main board		Screwdriver
8	Replacing the vacuum fan		

5.2 Greasing And Gluing Points

No.	Grease or Glue Point	Grease or Glue name	Application quantity
1	Cam	Shinetu silicon grease G501	Suitable quantity
2	X-drive motor pulley	Shinetu silicon grease G501	Suitable quantity
3	Y-drive motor pulley	Shinetu silicon grease G501	Suitable quantity
4	X-drive pulley	Shinetu silicon grease G501	Suitable quantity
5	Y-drive pulley	Shinetu silicon grease G501	Suitable quantity
6	Y-tension pulley	Shinetu silicon grease G501	Suitable quantity
7	Y-rail, pinch roller assy sliding area	Shinetu silicon grease G501	Suitable quantity
8	Y-motor drive pulley set screws	Loctite 222	Small quantity
9	X-motor drive pulley set screws	Loctite 222	Small quantity
10	X-drive pulley set screws	Loctite 222	Small quantity

6. DISASSEMBLY AND REASSEMBLY

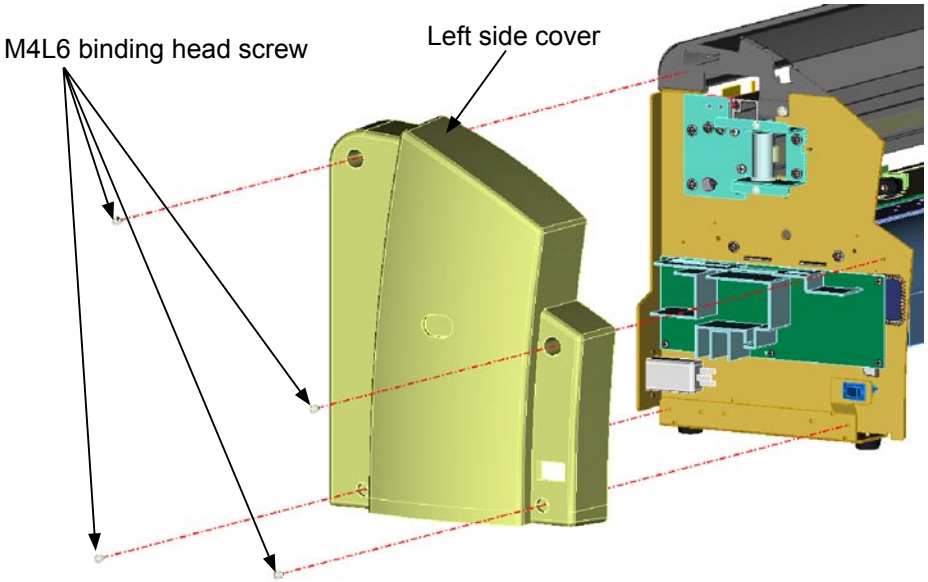
6.1 Exterior Parts

6.1.1 How to Replace the Right Side Cover

How to detach the right side cover

(1) Remove the four M4L6 binding head screws from the right side cover.

(2) Detach the the right side cover.



How to reinstall the right side cover

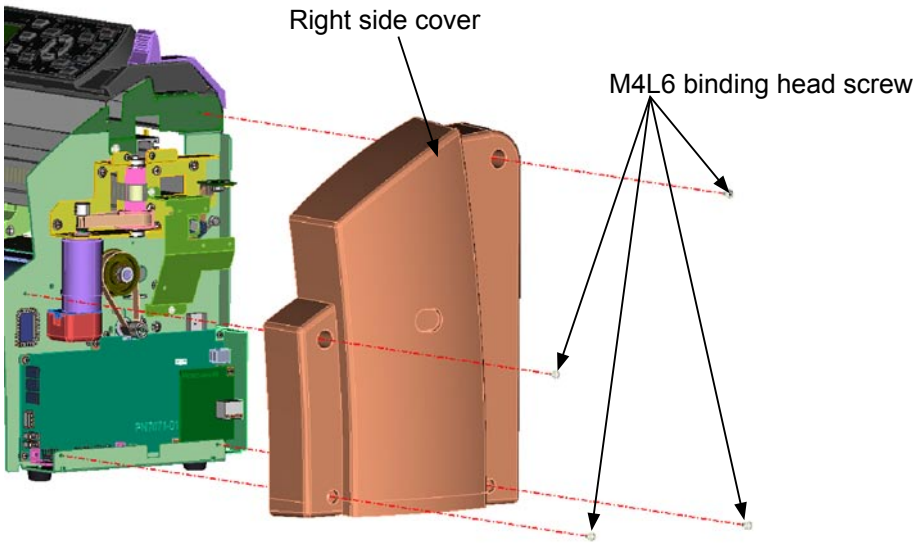
(1) Reattach the right cover in the reverse order in which it was detached.

6.1.2 How to Replace the Left Side Cover

How to detach the left side cover

(1) Remove the four M4L6 binding head screws from the left side cover.

(2) Detach the the left side cover.



How to reinstall the left side cover

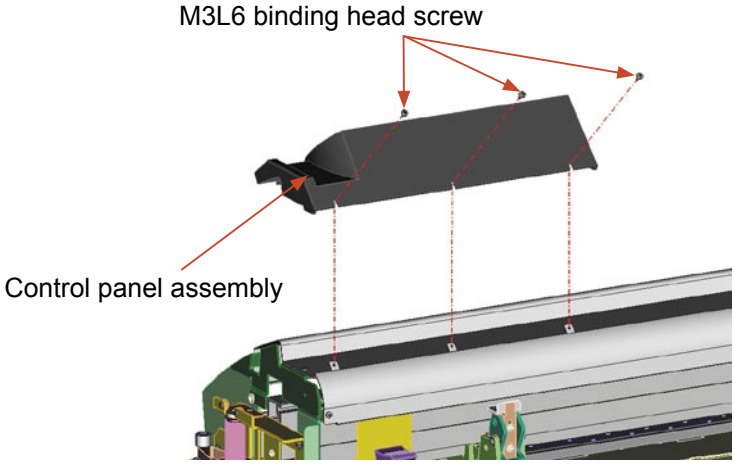
(1) Reattach the left cover in the reverse order in which it was detached.

6.1.3 How to Replace the Control Panel Assembly

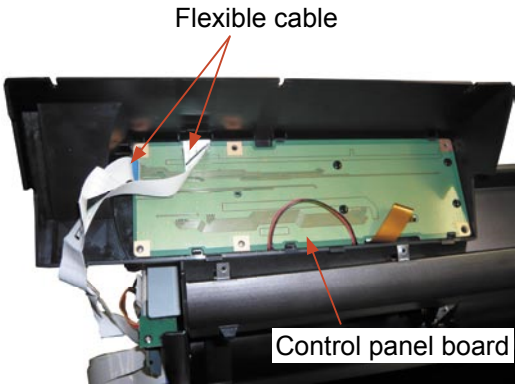
How to detach the control panel assembly

(1) Detach the right side cover (see Subsection 6.1.1).

(2) Remove the three M3L6 binding head screws holding the control panel assembly from the top of the center cover.



(3) Disconnect the two flexible cables from the control panel board.



How to reinstall the control panel assembly

(1) Reattach the control panel assembly in the reverse order in which it was detached.

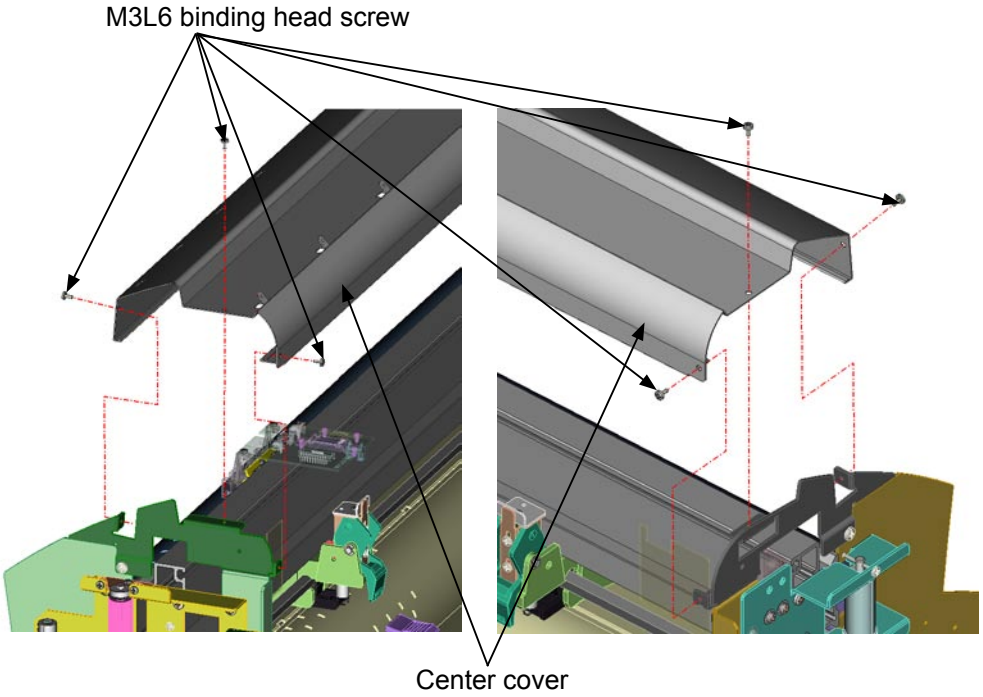
6.1.4 How to Replace the Center Cover

How to detach the center cover

(1) Detach the right side cover (see Subsection 6.1.1).

(2) Detach the control panel assembly (see Subsection 6.1.3).

(3) Remove the six M3L6 binding head screws holdong the center cover.



(4) Detach the center cover.

How to reinstall the center cover assembly

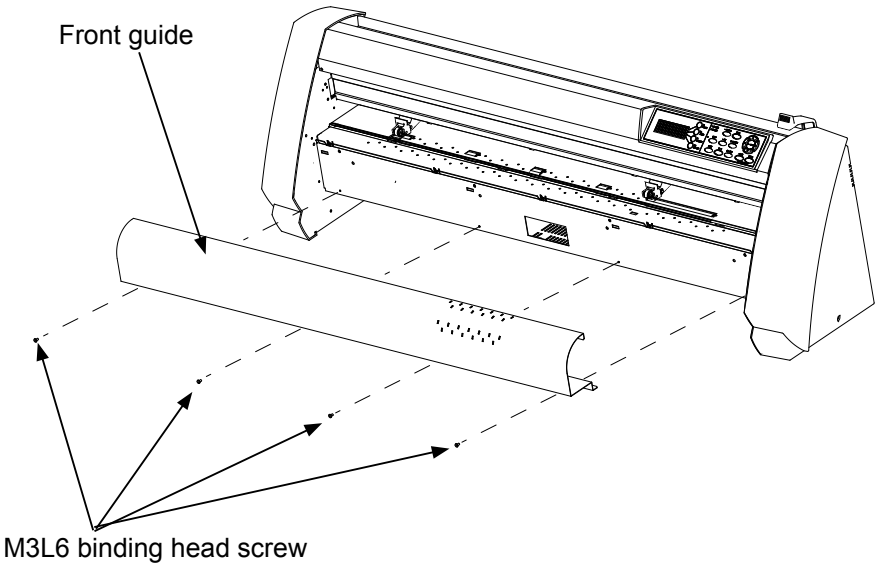
(1) Reattach the center cover in the reverse order in which it was detached.

6.1.5 How to Replace the Front Guide

How to detach the front guide

(1) Remove the four M3L6 binding head screws from the front guide for the FC8000-60/75.
(Remove the five M3L6 binding head screws from the front guide for the FC8000-100.
Remove the six M3L6 binding head screws from the front guide for the FC8000-130.
Remove the seven M3L6 binding head screws from the front guide for the FC8000-160.)

(2) Detach the front guide.



How to reinstall the front guide

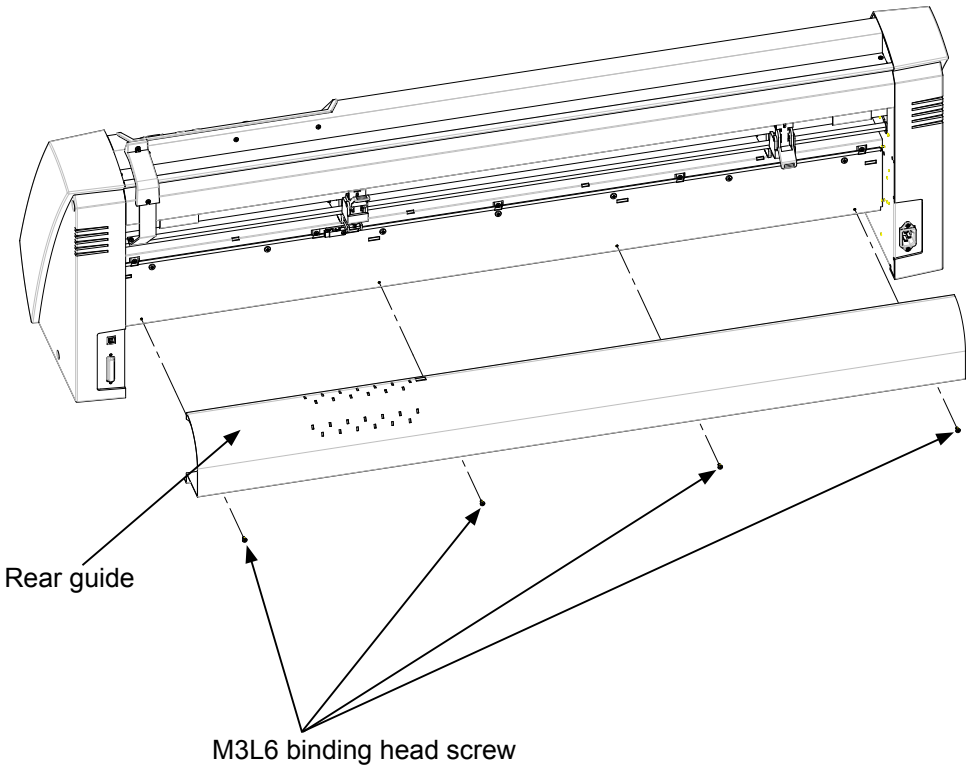
(1) Reattach the front guide in the reverse order in which it was detached.

6.1.6 How to Replace the Rear Guide

How to detach the rear guide

(1) Remove the four M3L6 binding head screws from the rear guide for the FC8000-60/75.
(Remove the five M3L6 binding head screws from the rear guide for the FC8000-100.
Remove the six M3L6 binding head screws from the rear guide for the FC8000-130.
Remove the seven M3L6 binding head screws from the rear guide for the FC8000-160.)

(2) Detach the rear guide.



How to reinstall the rear guide

(1) Reattach the rear guide in the reverse order in which it was detached.

6.1.7 How to Replace the Rear Writing Panel

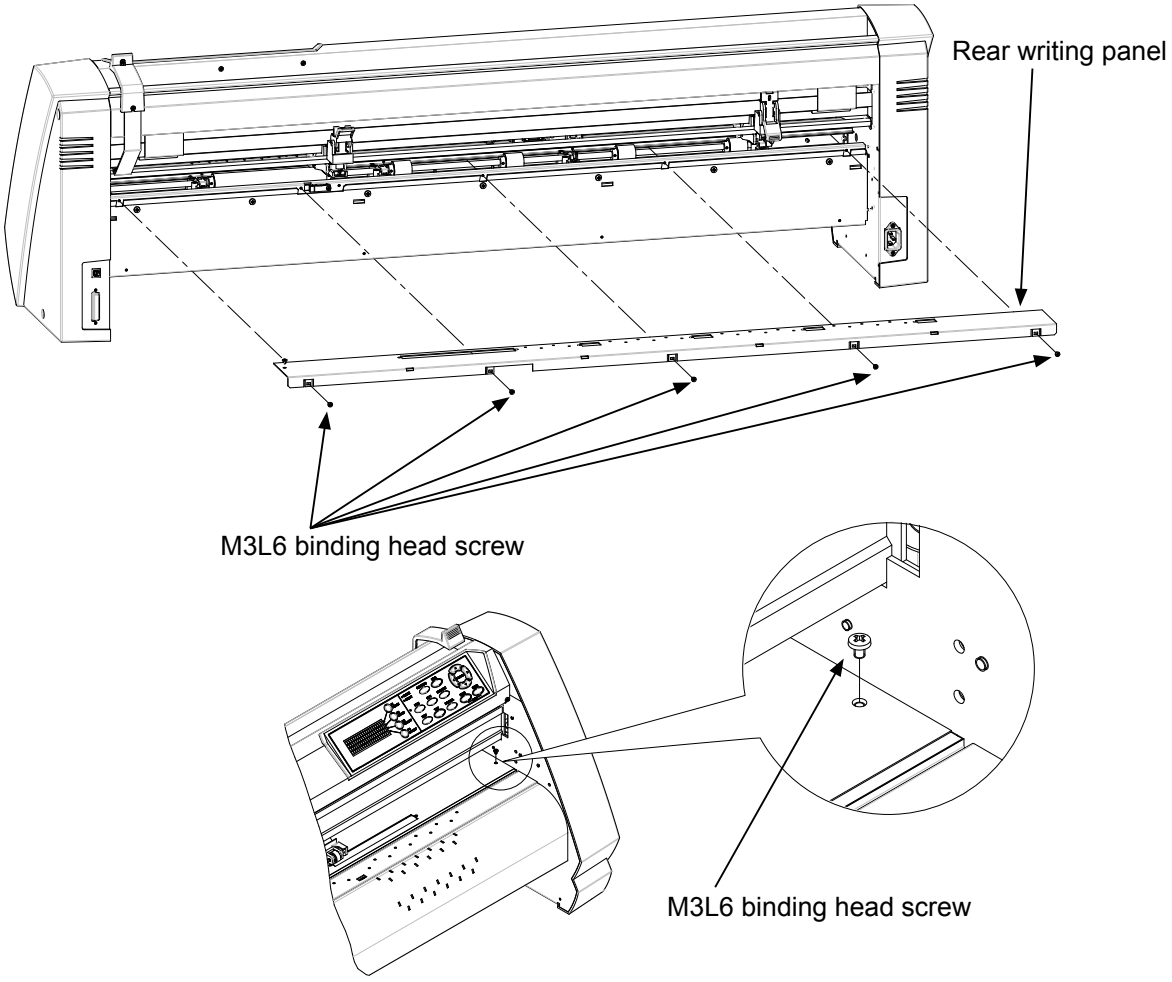
How to detach the rear writing panel

(1) Detach the rear guide (see Subsection 6.1.6).

(2) Remove the M3L6 binding head screw from the top of the rear writing panel.

(3) Remove the five M3L6 binding head screws from the rear of the rear writing panel for the FC8000-60/75.
(Remove the five M3L6 binding head screws from the rear of the rear writing panel for the FC8000-100.
Remove the six M3L6 binding head screws from the rear of the rear writing panel for the FC8000-130.
Remove the seven M3L6 binding head screws from the rear of the rear writing panel for the FC7000-160.)

(4) Detach the rear writing panel.



How to reinstall the rear writing panel

(1) Reattach the rear writing panel in the reverse order in which it was detached.

6.1.8 How to Replace the Front Writing Panel Assembly

How to detach the front writing panel assembly

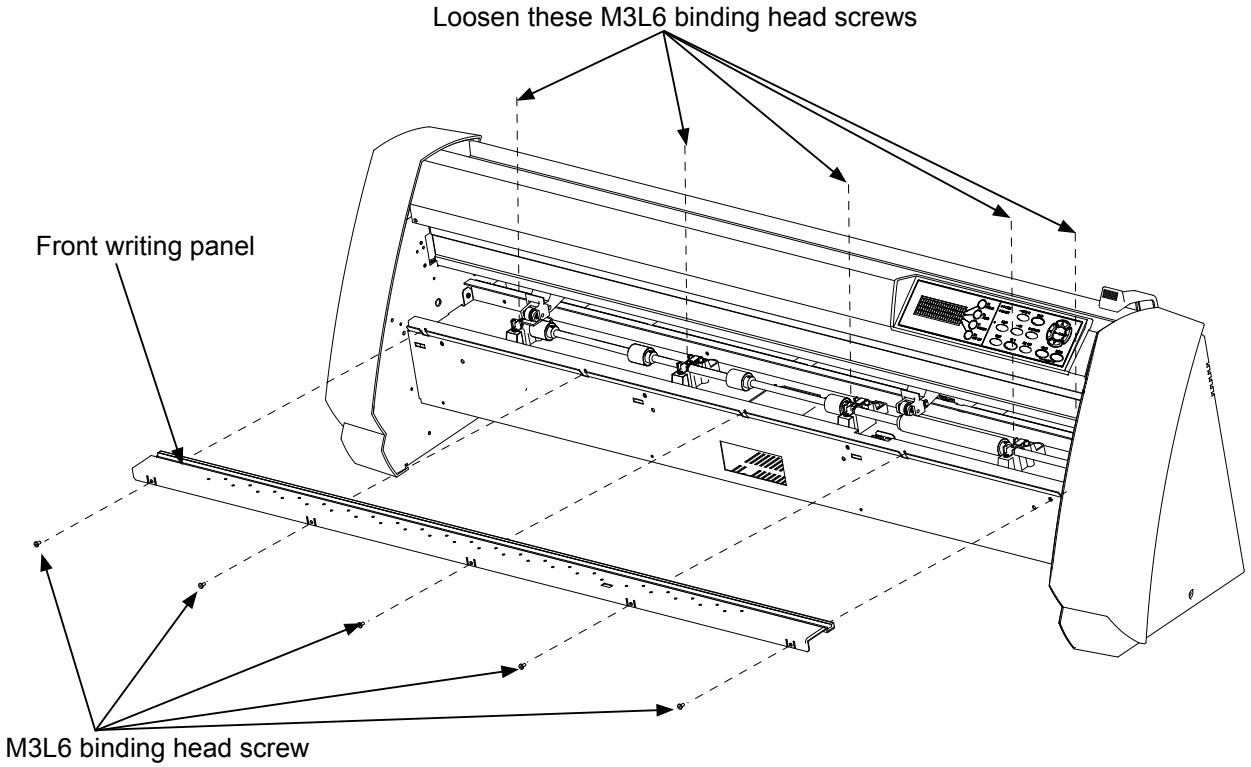
(1) Detach the front guide (see Subsection 6.1.5).

(2) Detach the rear writing panel (see Subsection 6.1.7).

(3) Remove the five M3L6 binding head screws from the front writing panel assembly for the FC8000-60/75.
(Remove the six M3L6 binding head screws from the front writing panel assembly for the FC8000-100.
Remove the seven M3L6 binding head screws from the front writing panel assembly for the FC8000-130.
Remove the eight M3L6 binding head screws from the front writing panel assembly for the FC8000-160.)

(4) Loosen the five M3L6 binding head screws at the top of the front writing panel assembly for the FC8000-60/75.
(Loosen the six M3L6 binding head screws at the top of the front writing panel assembly for the FC8000-100.
Loosen the seven M3L6 binding head screws at the top of the front writing panel assembly for the FC8000-130.
Loosen the eight M3L6 binding head screws at the top of the front writing panel assembly for the FC8000-160.

(5) Detach the front writing panel assembly.



How to reinstall the front writing panel assembly

(1) Reattach the front writing panel in the reverse order in which it was detached.

6.2 Mechanical Parts

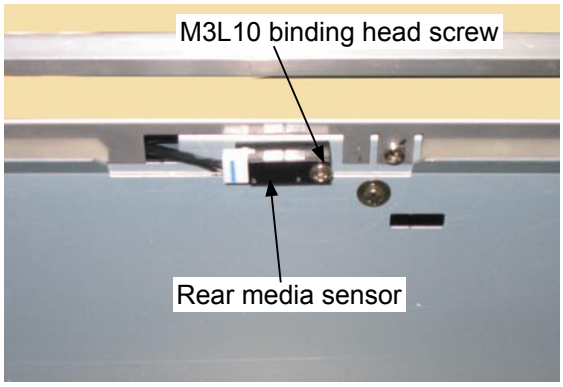
6.2.1 How to Replace the Rear Media Sensor

How to detach the rear media sensor

(1) Detach the rear guide (see Subsection 6.1.6).

(2) Remove the M3L10 binding head screw attaching the rear media sensor.

(3) Disconnect the sensor from the connector.



How to reinstall the rear media sensor

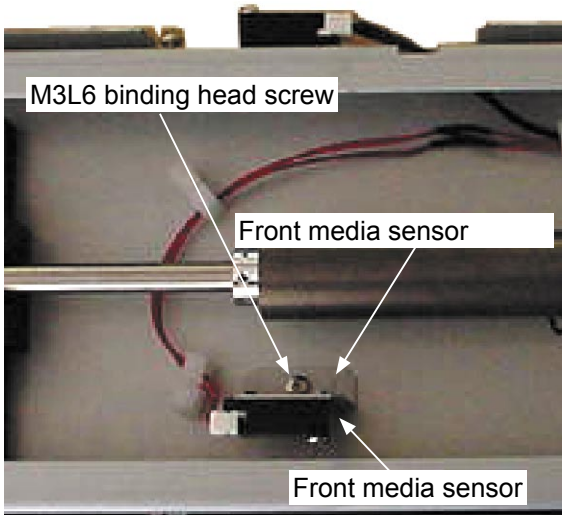
(1) Reattach the rear media sensor in the reverse order in which it was detached.

6.2.2 How to Replace the Front Media Sensor

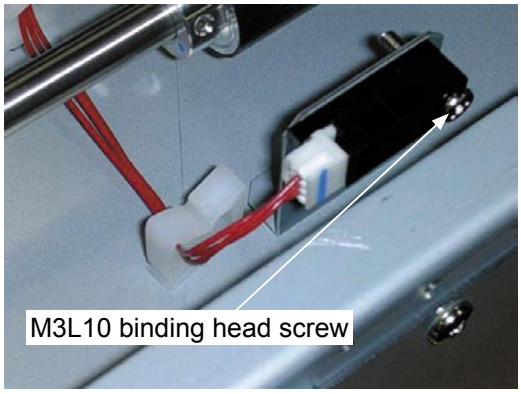
How to detach the front media sensor

(1) Detach the front writing panel (see Subsection 6.1.8).

(2) Remove the M3L6 binding head screw attaching the front media sensor bracket.



(3) Remove the M3L10 binding head screw attaching the front media sensor.



(4) Disconnect the sensor from the connector.

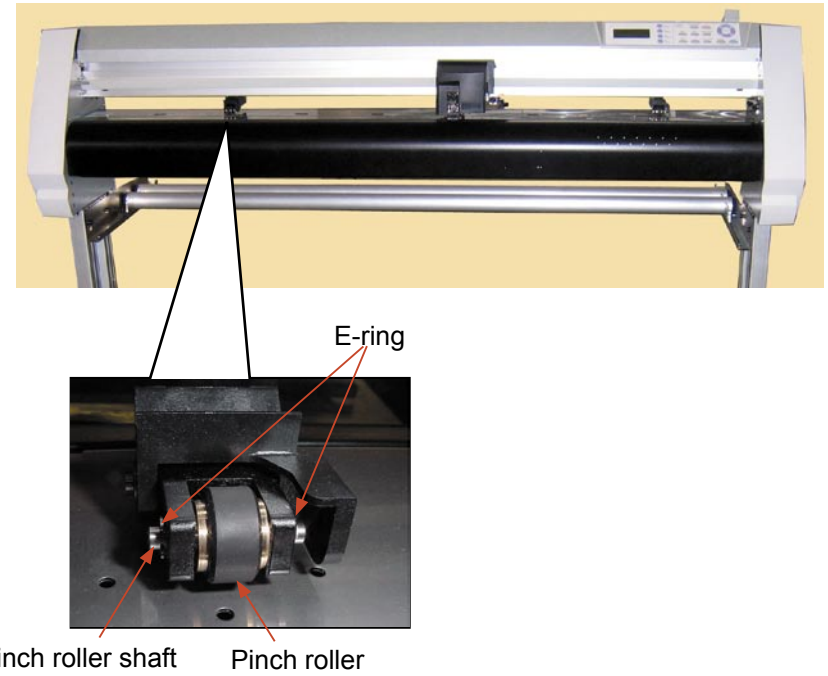
How to reinstall the front media sensor

(1) Reattach the front media sensor in the reverse order in which it was detached.

6.2.3 How to Replace the Pinch Roller

How to detach the pinch roller

(1) Detach the right side of the E-ring from the pinch roller shaft.



(2) Detach the pinch roller shaft from the pinch roller arm from the left side.

(3) Detach the pinch roller.

How to reinstall the pinch roller

(1) Reattach the pinch roller in the reverse order in which it was detached.

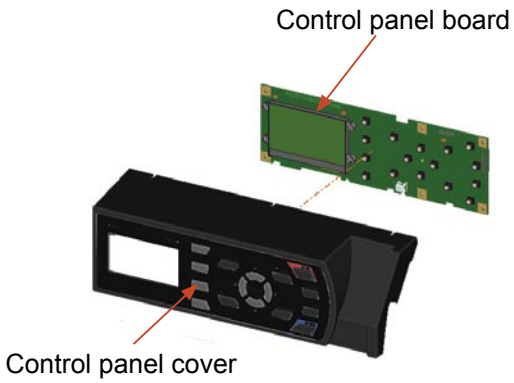
6.2.4 How to Replace the Control Panel Board and the LCD

How to detach the control panel board ant the LCD

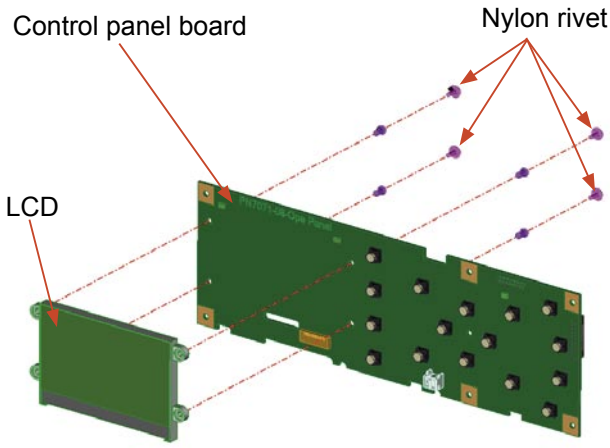
(1) Detach the control panel assembly (see Subsection 6.1.3).

(2) Detach the control panel board from the control panel cover assembly.

Release the hooks holding the control panel board, and then detach the control panel board from the control panel cover.



(3) Remove the four nylon rivets holding the LCD from the contrl panel board.



(4) Detach the LCD from the control panel board.

How to reinstall the control panel board and the LCD

(1) Reattach the control panel board and the LCD in the reverse order in which they were detached.

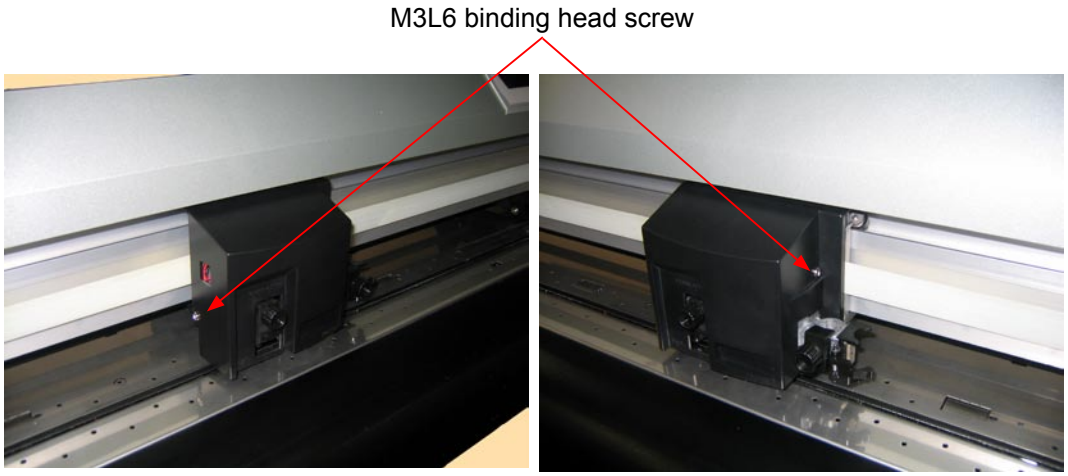
6.2.5 How to Replace the Pen Block

How to detach the pen block

(1) Detach the right side cover (see Subsection 6.1.1).

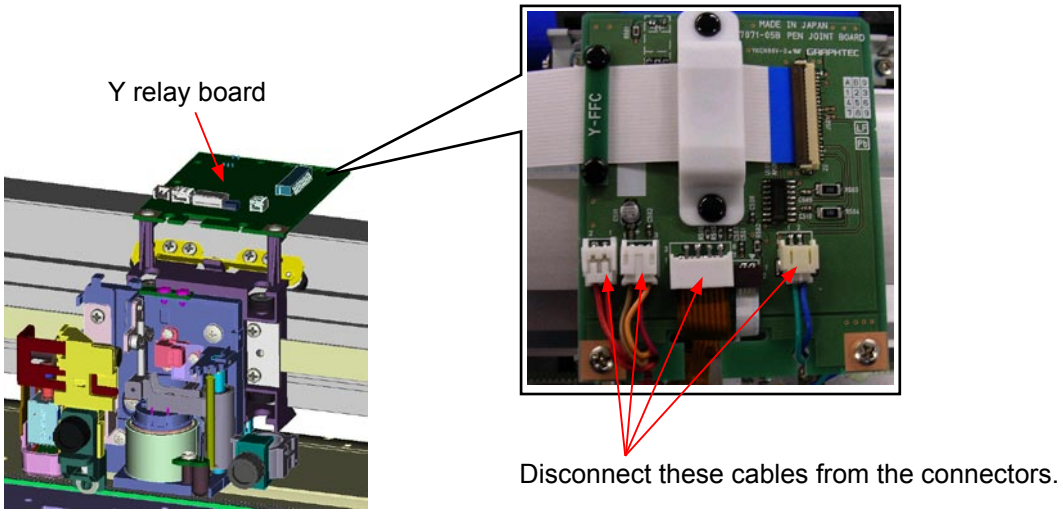
(2) Detach the center cover (see Subsection 6.1.4).

(3) Loosen the two M3L6 binding head screws attaching the pen block cover.

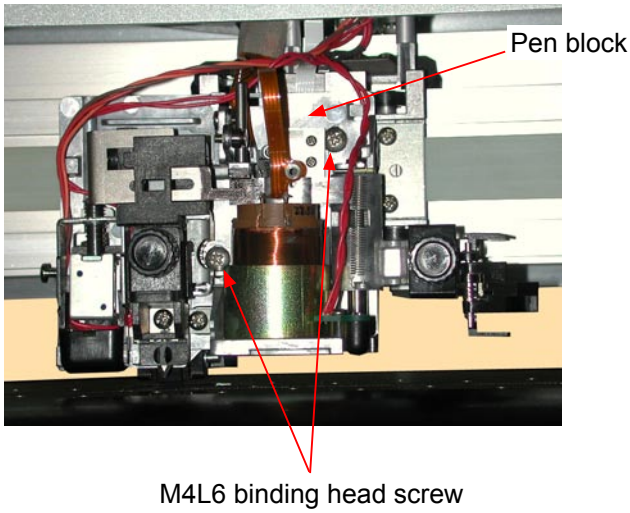


(4) Detach the pen block cover.

(5) Disconnect the cables from connector J502, J504, J505 and J506 on the Y-relay board.



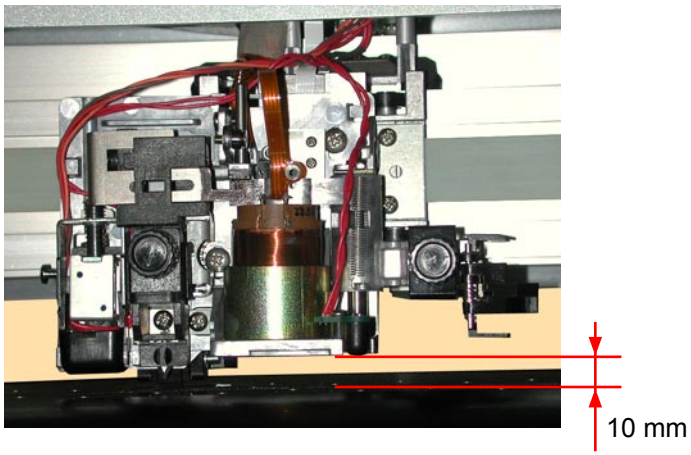
(6) Remove the two M4L6 binding head screws attaching the pen block.



How to reinstall the pen block

(1) Attach the pen block to the Y-slider.

(2) Fasten the two M4L6 binding head screws to attach the pen block so that there is a gap of 10 mm between the bottom of the pen block and the cutting mat. Perform a visual check to make sure that the pen block is not mounted at an angle.



(3) Reattach the other parts in the reverse order in which they were detached.

(4) Perform the pen force adjustment (see Section 7.3.7).

(5) Perform the auto registration mark sensor sensitivity adjustment (see Section 7.3.9).

(6) Perform the auto registration mark sensor offset adjustment (see Section 7.3.10).

6.2.6 How to Replace the Y-belt

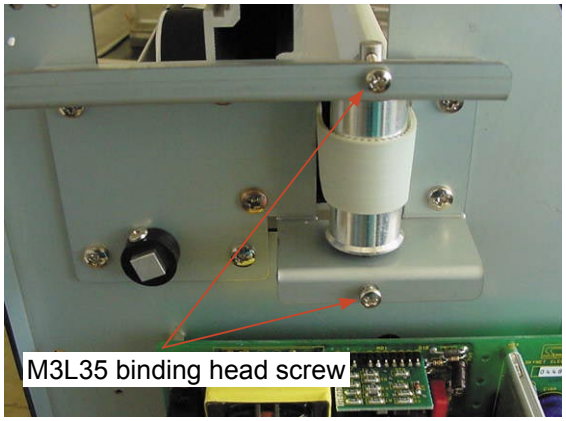
How to detach the Y-belt

(1) Detach the right and left side covers (see Subsection 6.1.1 and Subsection 6.1.2).

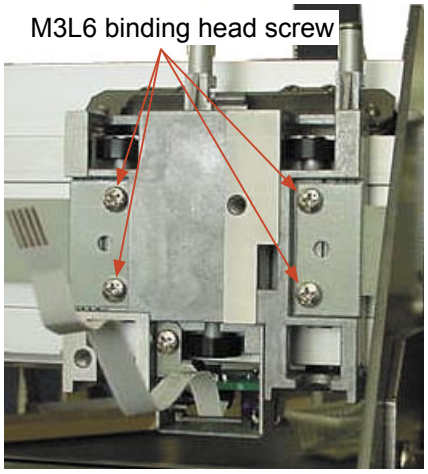
(2) Detach the center cover (see Subsection 6.1.4).

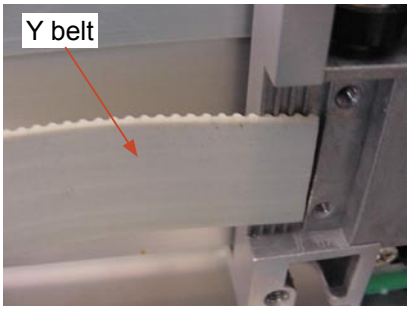
(3) Detach the pen block (see Subsection 6.2.5).

(4) Loosen the two M3L35 binding head screws adjusting the Y-belt tension.



(5) Remove the four M3L6 binding head screws attaching the right and left Y-belt stopper plates to the slider.

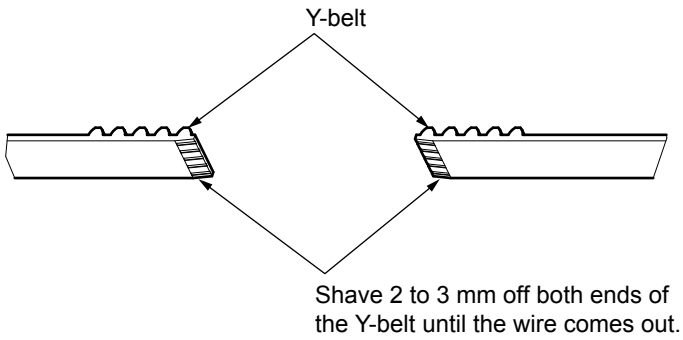




(6) Detach the Y-belt from the unit.

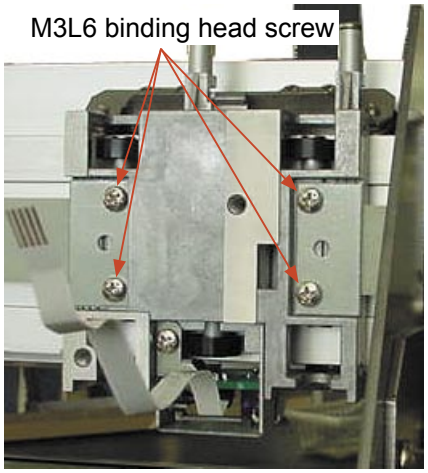
How to reinstall the Y-belt

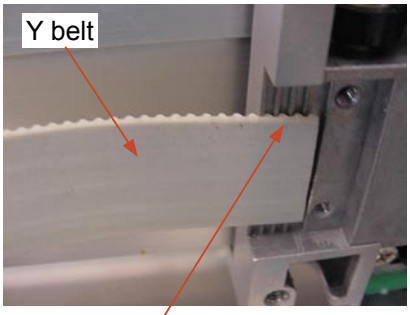
(1) Shave 2 to 3 mm off both ends of the Y-belt until the wire comes out as shown below.



(2) Hang the Y-belt on both sides of the pulley.

(3) Attach both ends of the Y-belt to the Y-slider so that four notches of the Y-belt fit into the Y-slider, then attach with the Y-belt stopper plates removed in step (5) in the previous subsection.





(4) Attach the pen block (see Subsection 6.2.5).

(5) Reattach the other parts in the reverse order in which they were detached.

(6) Perform the Y-belt tension adjustment. (see Subsection 7.2.1).

6.2.7 How to Replace the Pinch Roller Sensor

How to detach the pinch roller sensor

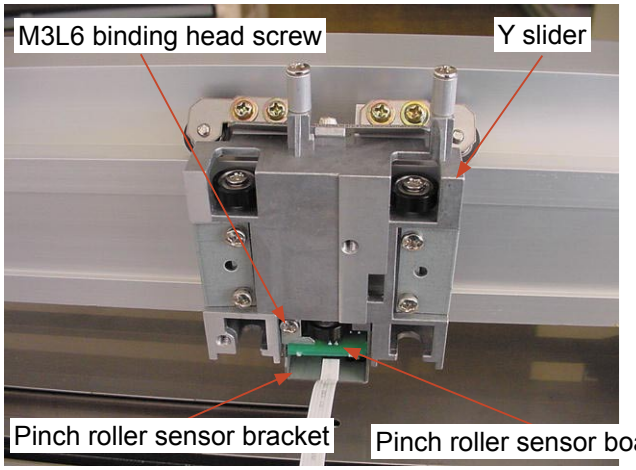
(1) Detach the center cover (see Subsection 6.1.4).

(2) Detach the pen block (see Subsection 6.2.5).

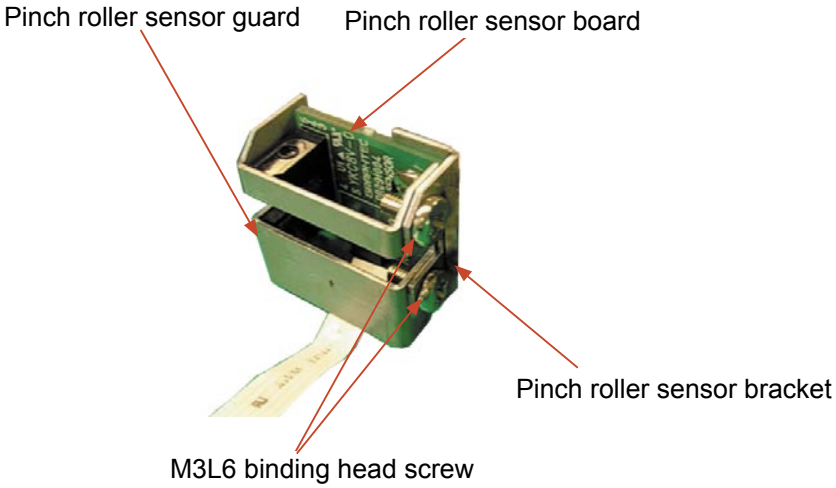
(3) Disconnect the pinch roller flexible cable from the Y-relay board.

(4) Remove the pinch roller flexible cable that is attached with double-sided adhesive tape to the Y-slider.

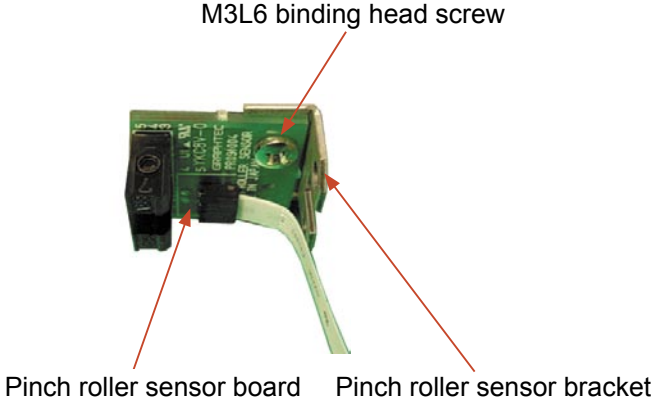
(5) Remove the M3L6 binding head screw attaching the pinch roller sensor bracket to the slider.



(6) Remove the two M3L6 binding head screws attaching the pinch roller sensor guard.



(7) Remove the M3L6 binding head screw attaching the pinch roller sensor board.



(8) Disconnect the pinch roller flexible cable from the pinch roller sensor board.

How to reinstall the pinch roller sensor

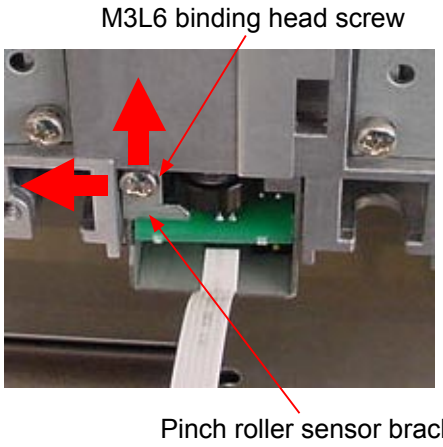
(1) Attach the pinch roller bracket to the pinch roller sensor board.

(2) Connect the pinch roller flexible cable to the pinch roller sensor board.

(3) Attach the pinch roller sensor guard to the pinch roller sensor board bracket.

(4) Attach the pinch roller bracket to the Y-slider.

Fit the top and left edges of the pinch roller bracket to the Y-slider as shown in the figure below.



(5) Attach the pen block (see Subsection 6.2.5).

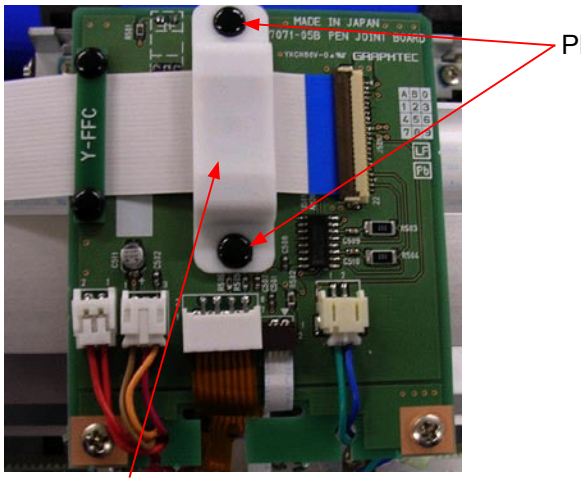
(6) Reattach the other parts in the reverse order in which they were detached.

6.2.8 How to Replace the Y-relay Board

How to detach the Y-relay board

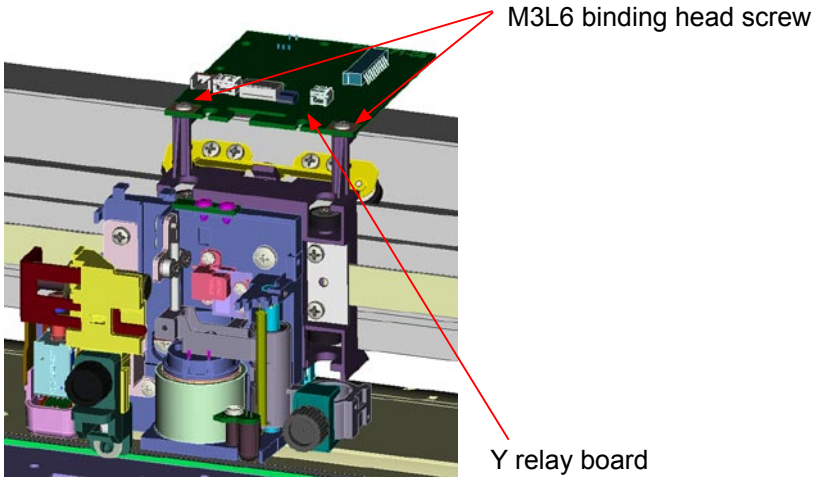
(1) Detach the center cover (see Subsection 6.1.4).

(2) Remove the two plastic rivets attaching the flexible cable holding plate.



(3) Disconnect all the cables from the Y-relay board.

(4) Remove the two M3L6 binding head screws attaching the Y-relay board.



(5) Detach the Y-relay board from the Y-slider.

How to reinstall the Y-relay board

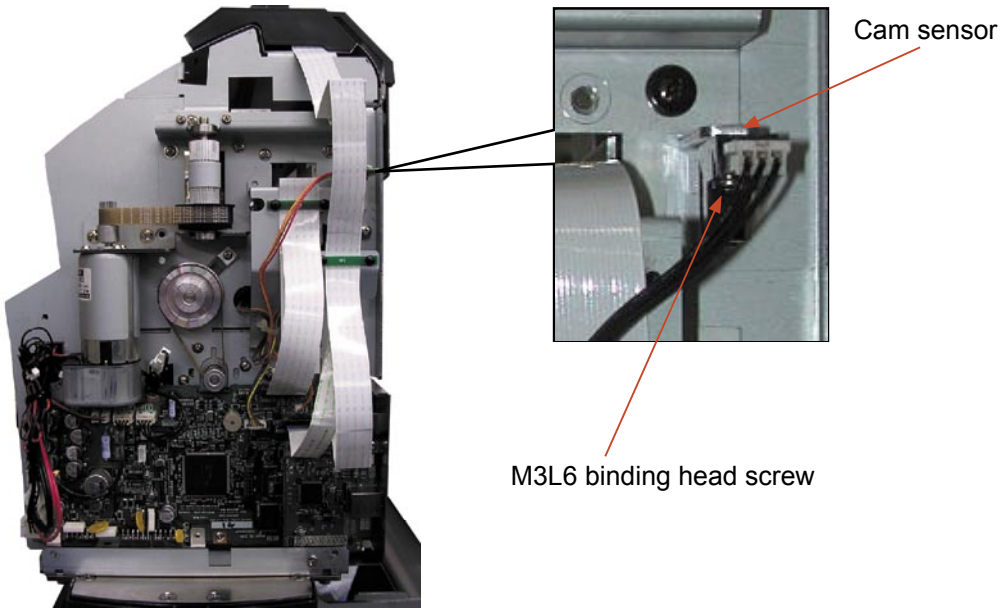
(1) Reattach the Y-relay board in the reverse order in which it was detached.

6.2.9 How to Replace the Cam Sensor

How to detach the cam sensor

(1) Detach the right side cover (see Subsection 6.1.1).

(2) Disconnect the cable from the cam sensor.



(3) Remove the M3L6 binding head screw attaching the cam sensor.

How to reinstall the cam sensor

(1) Reattach the cam sensor in the reverse order in which it was detached.

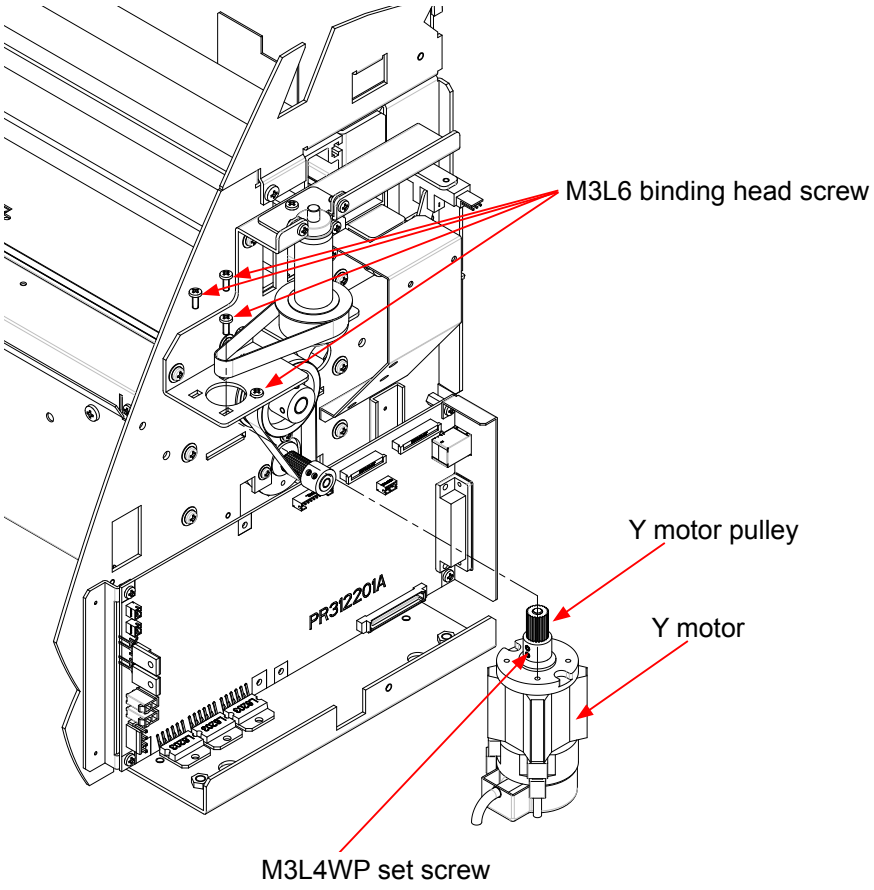
6.2.10 How to Replace the Y-motor

How to detach the Y-motor

(1) Detach the right side cover (see Subsection 6.1.1).

(2) Disconnect the Y-motor cables from connector J7 and J13 on the main board.

(3) Loosen the two M3L4WP set screws to detach the Y-motor pulley.



(4) Remove the four M3L6 binding head screws holding the Y-motor.

(5) Detach the Y-motor pulley, then detach the Y-motor.

How to reinstall the Y-motor

(1) Attach the Y-motor to the Y-motor bracket.

(2) Hang the Y-drive belt on the Y-motor pulley and the Y-idler pulley.

(3) Attach the Y-motor pulley to the Y-motor.

(4) Tighten the two M3L4WP set screws that hold the Y-motor pulley.

(5) Spread a suitable quantity of Loctite 222 on the two M3L4WP set screws that hold the Y-motor pulley.

(6) Spread a suitable quantity of the Shinetu silicon grease G501 on the Y-motor pulley and Y-idler pulley.

(7) Perform the Y-drive belt tension adjustment. (see Subsection 7.2.2).

(8) Reattach the other parts in the reverse order in which they were detached.

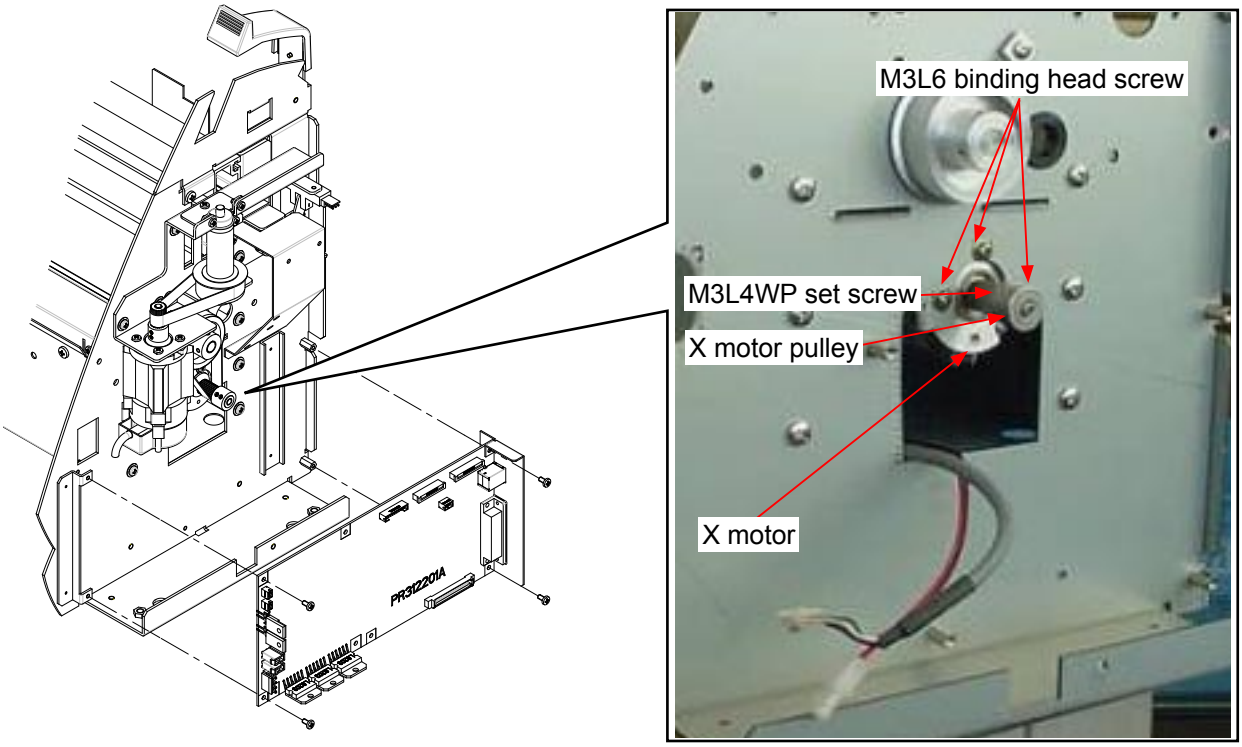
6.2.11 How to Replace the X-motor

How to detach the X-motor

(1) Detach the right side cover (see Subsection 6.1.1).

(2) Detach the main board (see Subsection 6.2.12).

(3) Loosen the two M3L4WP set screws holding the X-motor pulley, then detach the X-motor pulley.



(4) Remove the three M3L6 binding head screws holding the X-motor, then detach the X-motor.

How to reinstall the X-motor

(1) Attach the X-motor to the right side plate.

(2) Hang the X-drive belt on the X-drive pulley.

(3) Attach the X-motor pulley to the X-motor.

(4) Tighten the two M3L4WP set screws that hold the X-motor pulley.

(5) Spread a suitable quantity of Loctite 222 on the two M3L4WP set screws that hold the X-motor pulley.

(6) Perform the X-drive belt tension adjustment. (see Subsection 7.2.3).

(7) Tighten the mounting screws that hold the X-motor.

(8) Spread a suitable quantity of the Shinetu silicon grease G501 on the X-motor pulley.

(9) Move the X-drive pulley and check the tension of the X-drive belt.

(10) Reattach the other parts in the reverse order in which they were detached.

6.2.12 How to Replace the Main Board

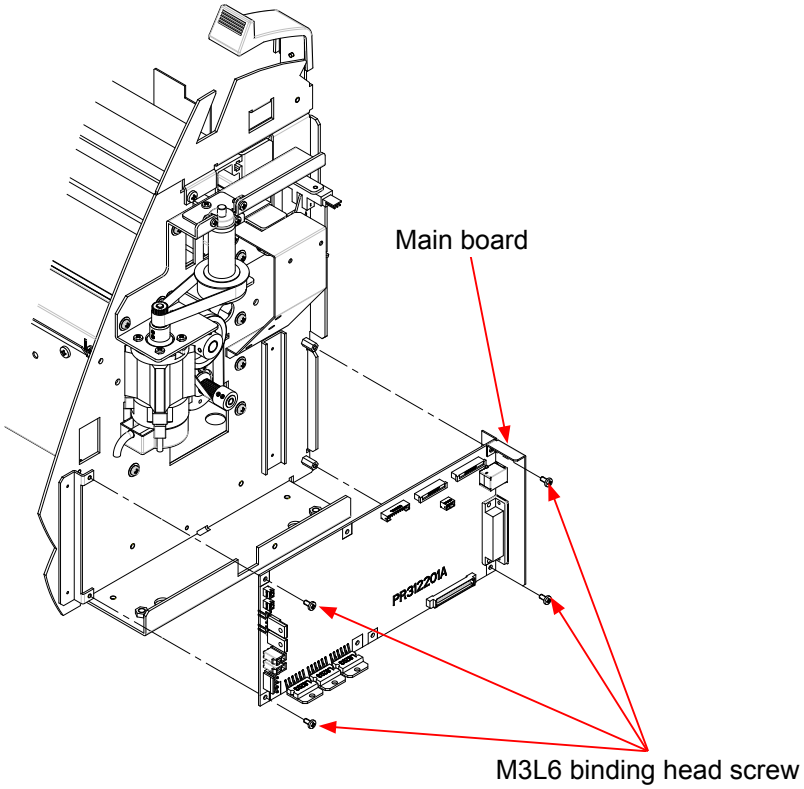
How to detach the main board

(1) Detach the right side cover (see Subsection 6.1.1).

(2) Disconnect all the cables and flexible cables from their connectors on the main board.

(3) Remove the four M3L6 binding head screws holding the main board to the chassis.

(4) Detach the main board from the chassis.



How to reinstall the main board

(1) Reattach in the reverse order in which it was detached.

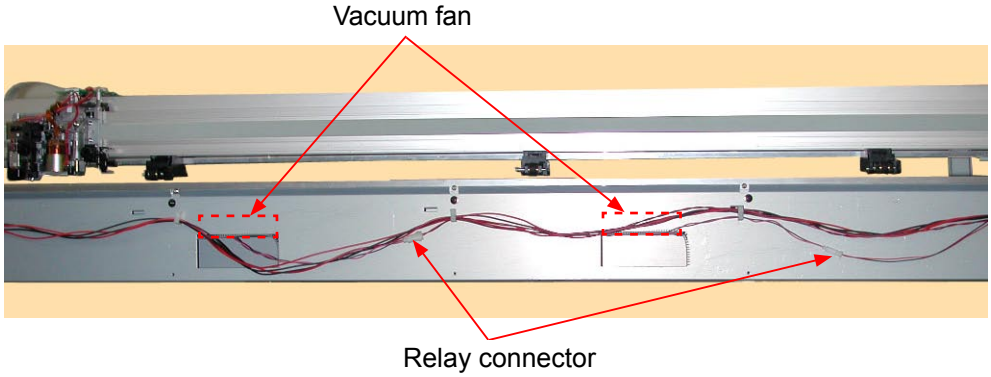
(2) Perform any adjustments required (see Section 7.1).

6.2.13 How to Replace the Vacuum Fan

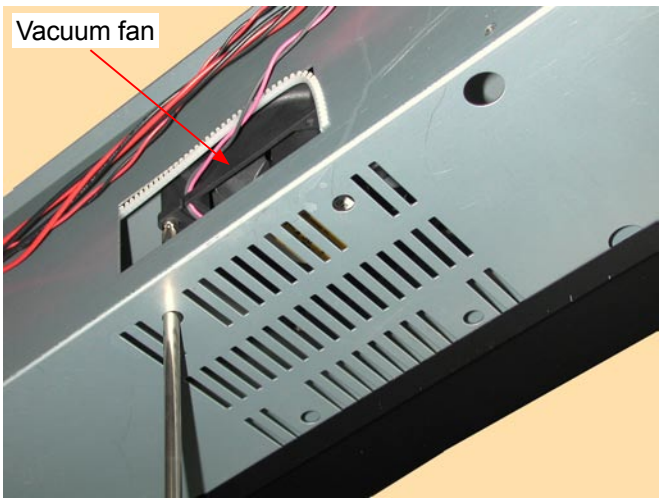
How to detach the vacuum fan

(1) Detach the front guide (see Subsection 6.1.5).

(2) Disconnect the vacuum fan from the relay connector.



(3) Use a long screwdriver to remove the two M3L35 binding head screws holding the vacuum fan as shown in the figure below.



(4) Detach the vacuum fan.

How to reinstall the vacuum fan

(1) Reattach in the reverse order in which it was detached.

6.2.14 How to Replace the Drive Roller

How to detach the drive roller

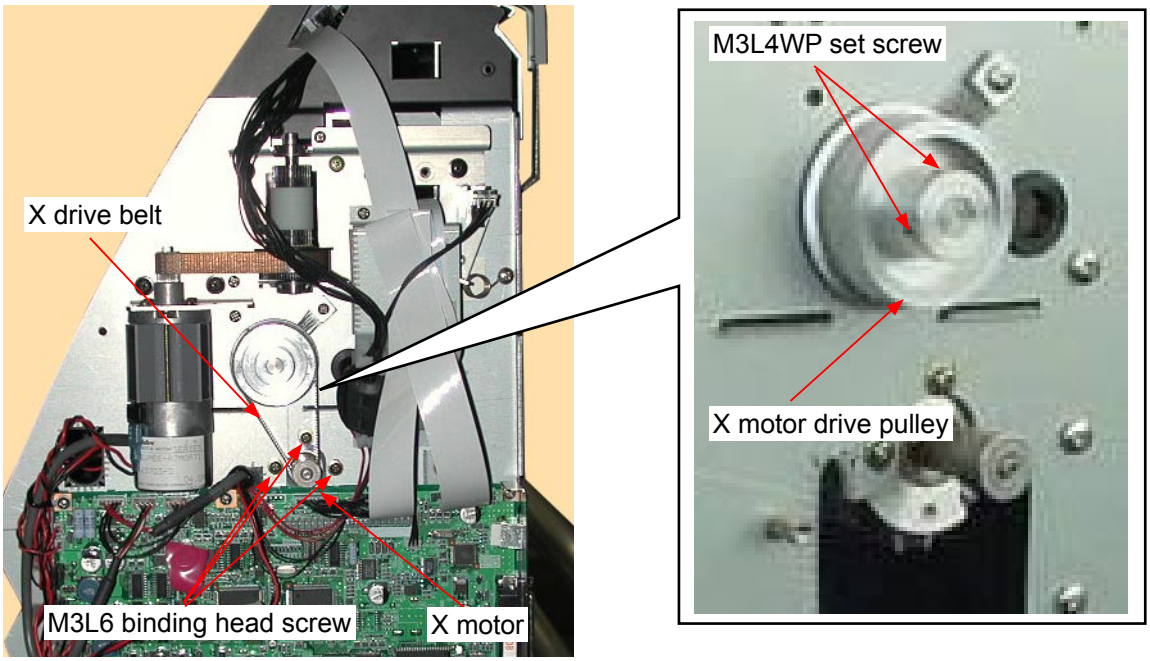
(1) Detach the right and left side covers (see Subsection 6.1.1).

(2) Detach the front guide and rear guide (see Subsection 6.1.5 and Subsection 6.1.5).

(3) Detach the rear and front writing panels. (see Subsection 6.1.7 and Subsection 6.1.7).

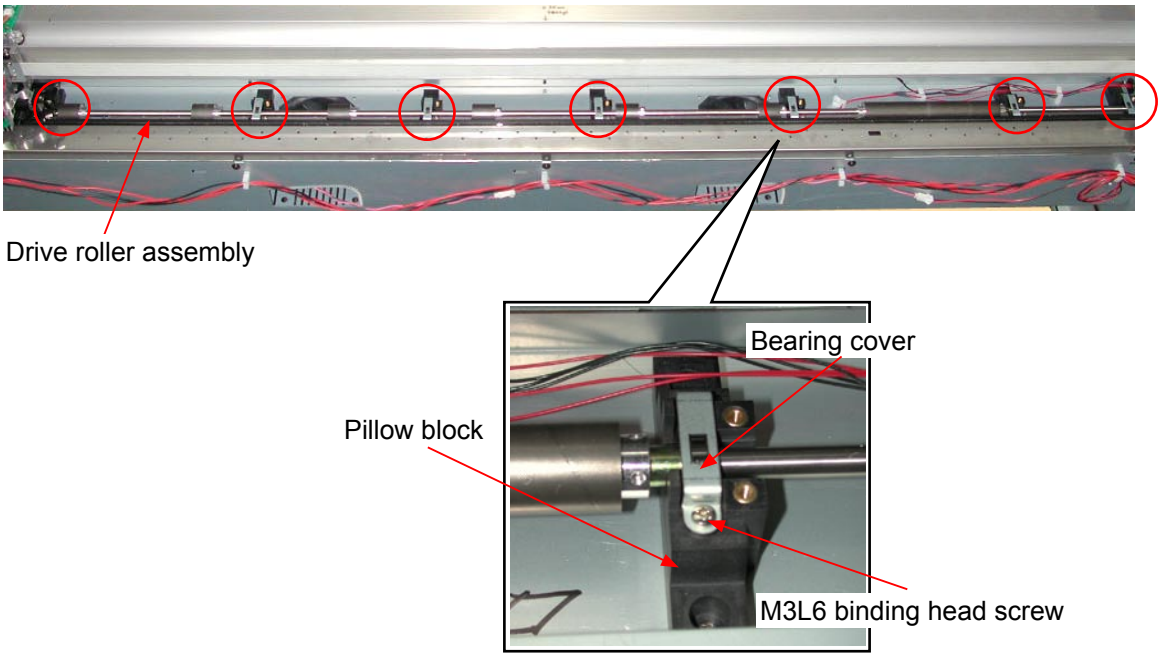
(4) Loosen the three M3L6 binding head screws holding the X-motor to loosen the X drive belt.

(5) Remove the two M3L4WP set screws holding the X-drive pulley and detach the X-drive pulley from the drive roller.



(6) Remove the X drive belt from the X-motor pulley.

(7) Remove the M3L6 binding head screws holding the bearing covers and detach the bearing covers from the pillow blocks. (Don't remove the M3L6 binding head screws holding the pillow blocks.)



(8) Slide out the X-drive roller to the left side and detach the X drive roller assembly from the unit.

How to reinstall the drive roller

(1) Reattach in the reverse order in which it was detached.

(2) Spread a suitable quantity of Loctite 222 on the two M3L4WP set screws holding the X-drive pulley.

(3) Perform the X-drive belt tension adjustment. (see Subsection 7.2.3).

(4) Spread a suitable quantity of the Shinetu silicon grease G501 on the X-motor pulley.

(5) Move the X-drive pulley and check the tension of the X-drive belt.

(6) Reattach the other parts in the reverse order in which they were detached.

6.2.15 How to Replace the Cutting Mat

How to detach the cutting mat

(1) Peel off the cutting mat from the cutting mat base.

How to reinstall the cutting mat

(1) Clean the surface of the cutting mat base with alcohol where the cutting mat was attached.

(2) Attach the new cutting mat to the cutting mat base.

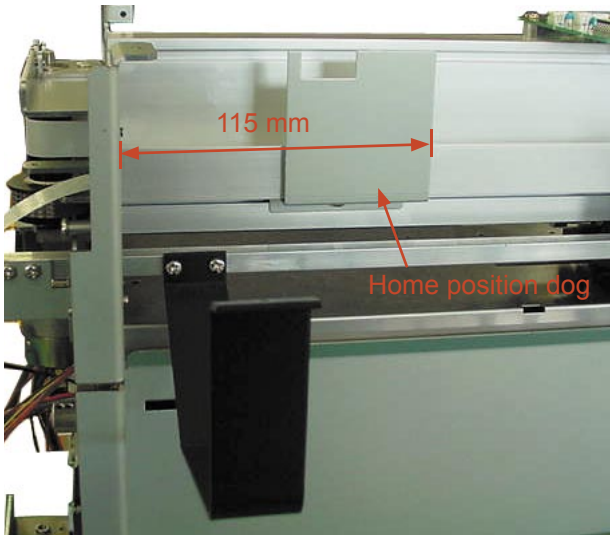
(3) Make sure that there is no air between the cutting mat and the cutting mat base.

6.2.16 Home Dog Position

Home dog position

Adjust the home dog position when you remove or replace the dog as shown below.

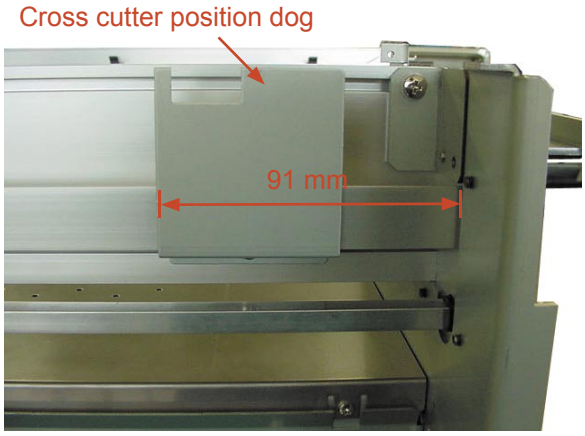
If you have an error about the pinch roller position, confirm position of this dog.



6.2.17 Cross Cutter Dog Position

Cross cutter dog position

Adjust the cross cutter position dog when you remove or replace the dog as shown below.



7. ADJUSTMENTS

7.1 List of Items Requiring Readjustment

If you replaced any of the units listed in the table below or altered their sensor positions, be sure to readjust the corresponding items.

Item \ Unit name	Main board	Light pointer	Pen block	Pinch roller sensor	X,Y motor	Drive roller	X,Y Motor drive belt	Auto registration mark sensor
NOV-RAM clear	M							
Pen force adjustment	M		M					
Distance adjustment	M					M	M	
Auto registration mark sensor adjustment	N		N	N				M
Light pointer adjustment	N	M	N					
Firmware upgrade	M							
Belt tension adjustment					M	M	M	
Pinch roller pressure adjustment						M		
2-Pen option adjustment	N		N					
DIP switch setting	N							
Servo gain adjustment	N				N			

No mark: Unnecessary M: Must always be adjusted N: To be adjusted as necessary

Note: The main board must have the latest version of firmware unless otherwise specified.

7.2 Mechanical Adjustments

7.2.1 Y-Belt Tension Adjustment

How to adjust the Y-belt tension

Belt tension adjustment is required to set proper tension of the belt to maintain machine performance, reduce overshoot, and correct any out-of-phase condition in the Y-axis.

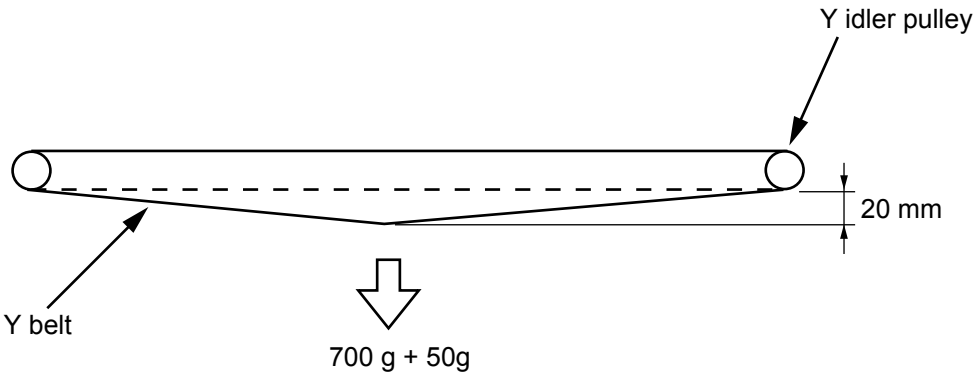
(1) Detach the right side cover (see Subsection 6.1.1).

(2) With the Y-slider on the Y-rail and the belt attached, adjust the Y-tension pulley adjustment screws that hold the Y-tension pulley onto the left side plate in order to tighten the Y-slider belt. Do not over-tighten. Move the Y-slider from left to right several times to verify that the tension is set correctly.

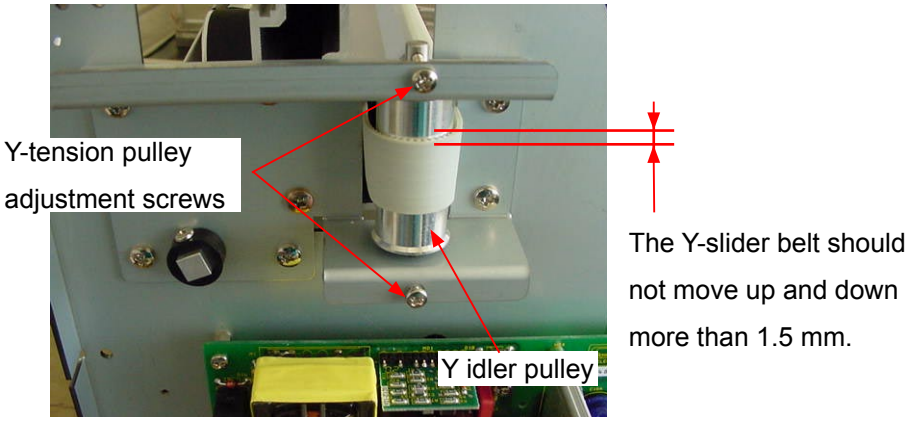
(3) Move the Y-slider all the way to the right and pull the belt 20 mm towards the center using a force gauge. Adjust the Y-tension pulley adjustment screws evenly until the tension reads as follows:

Specification of the Belt Tension

Model	Force gauge reading specification
FC8000-60	700 g+50
FC8000-75	700 g+50
FC8000-100	700 g+50
FC8000-130	700 g+50
FC8000-160	700 g+50



(4) Verify that the Y-slider belt is centered and does not move up and down when the Y-slider is moved from left to right several times. The Y-slider belt should not move up and down more than 1.5 mm.



(5) If the Y-slider belt continues to move up and down or exhibits less clearance, re-adjust the Y-tension pulley adjustment screws and check the belt tension again.

(6) Reattach the right side cover.

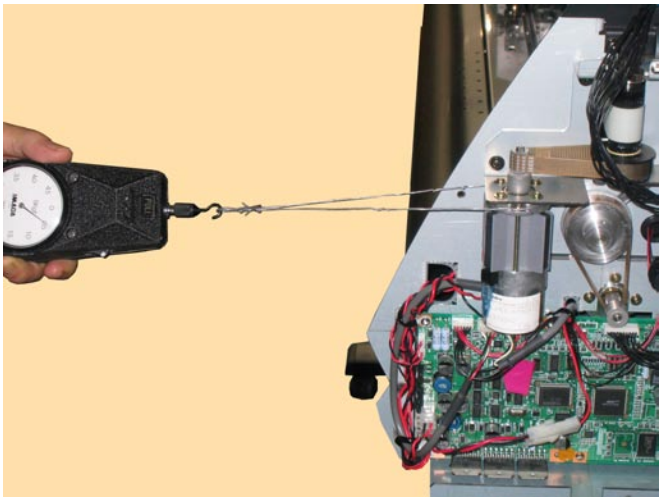
7.2.2 Y-Drive Belt Tension Adjustment

How to adjust the Y-Drive belt tension

(1) Detach the right side cover (see Subsection 6.1.1).

(2) Loosen the four M3L6 binding head screws that hold the Y-motor.

(3) Use the force gauge to pull the Y-drive motor pulley flange with a 2.25 kg force.



(4) Tighten the four M3L6 binding head screws that hold the Y-motor.

(5) Spread a suitable quantity of the Shinetu silicon grease G501 on the Y-motor pulley.

(6) Move the pen block and check the tension of the Y-drive belt.

(7) Reattach the right side cover.

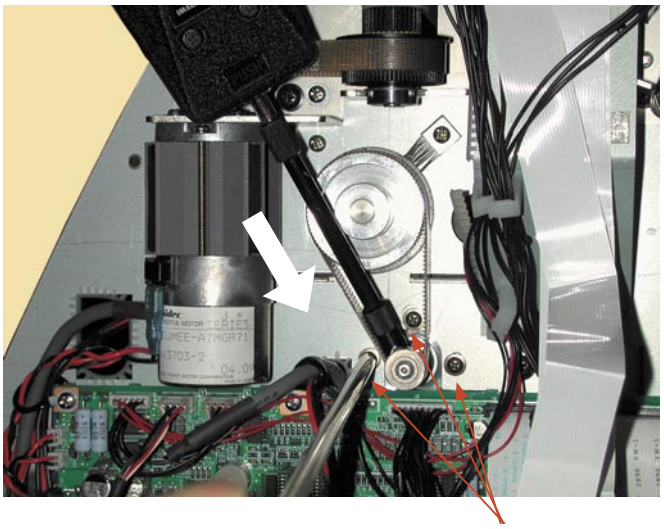
7.2.3 X-Drive Belt Tension Adjustment

How to adjust the X-Drive belt tension

(1) Detach the right side cover (see Subsection 6.1.1).

(2) Loosen the three M3L6 binding head screws that hold the X-motor.

(3) Use the force gauge to push the X-drive motor pulley flange with a 800 g force as shown in the figure below.



M3L6 binding head screw

(4) Tighten the mounting screws that hold the X-motor.

(5) Spread a suitable quantity of the Shinetu silicon grease G501 on the X-motor pulley.

(6) Move the X-drive pulley and check the tension of the X-drive belt.

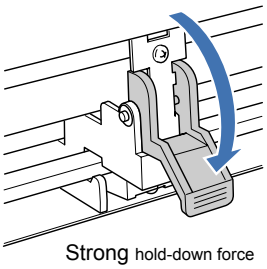
(7) Reattach the right side cover.

7.2.4 Pinch Roller Pressure Adjustment

How to adjust the pinch roller pressure

(1) Detach the center cover (see Subsection 6.1.3).

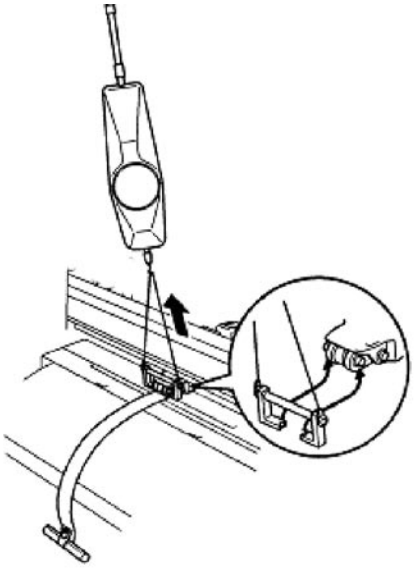
(2) Change the hold-down force switching lever to the Strong position.



Strong hold-down force

(3) Place the pinch roller on the grit roller.

(4) Sandwich the stainless steel plate jig as shown in the figure below and catch the push pressure wire jig on the pinch roller shaft.

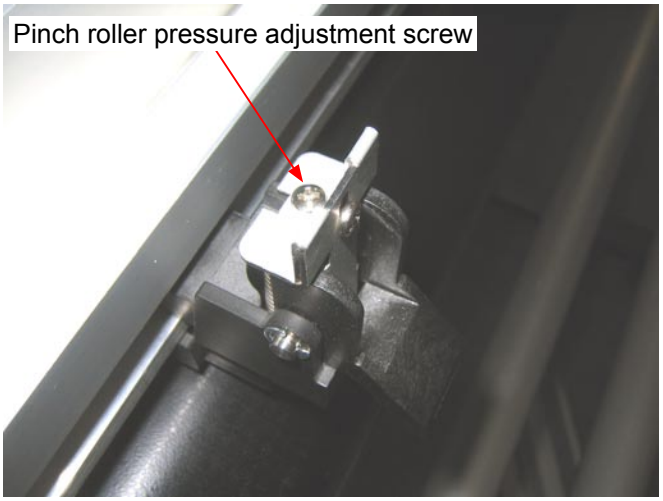


(5) Pull the wire of the push pressure wire jig in the direction of the arrow with the 10 kgf push-pull gauge.

Note *Be sure to pull in the correct direction.
*Be sure to pull at the angle shown in the figure above (the angle at which the wire jig is almost touching the Y rail).

(6) Read out the value at which the stainless steel plate jig slips out.
The pinch roller pressure should be 6.5 kg ±0.25 force.
The pressure difference between each pinch roller should be less than 0.4 kg.

(7) If the measurement does not match this value, adjust the pinch roller pressure adjustment screw and check again.



(8) Reattach the center cover.

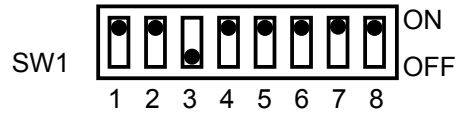
7.3 Electrical Adjustments

7.3.1 DIP Switch Settings

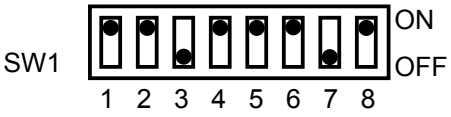
The black circles indicate the position of each switch.

Factory presets (Normal Mode)

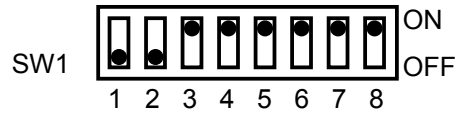
FC8000-60



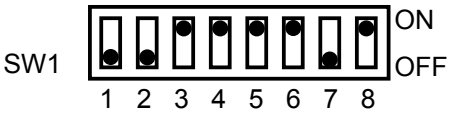
FC8000-60 (2-Pen Model)



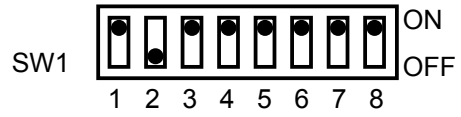
FC8000-75



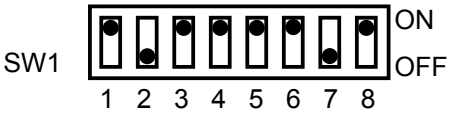
FC8000-75 (2-Pen Model)



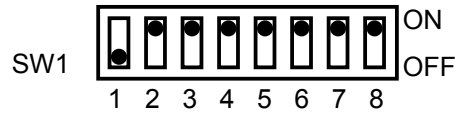
FC8000-100



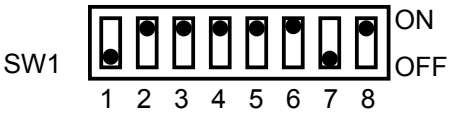
FC8000- (2-Pen Model)



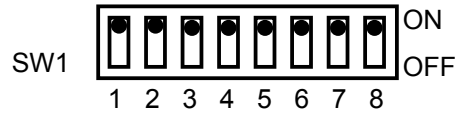
FC8000-100



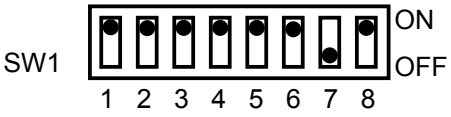
FC8000-130 (2-Pen Model)



FC8000-160

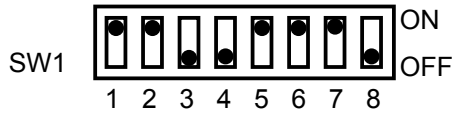


FC8000-160 (2-Pen Model)

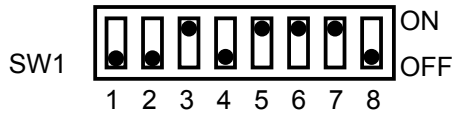


NOV-RAM Clear

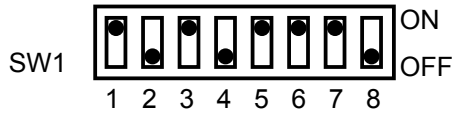
FC8000-60



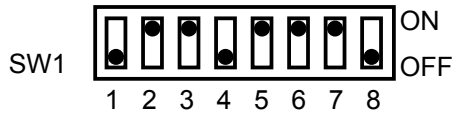
FC8000-75



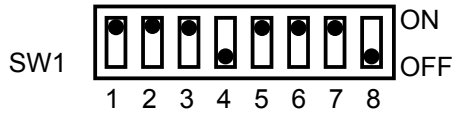
FC8000-100



FC8000-130



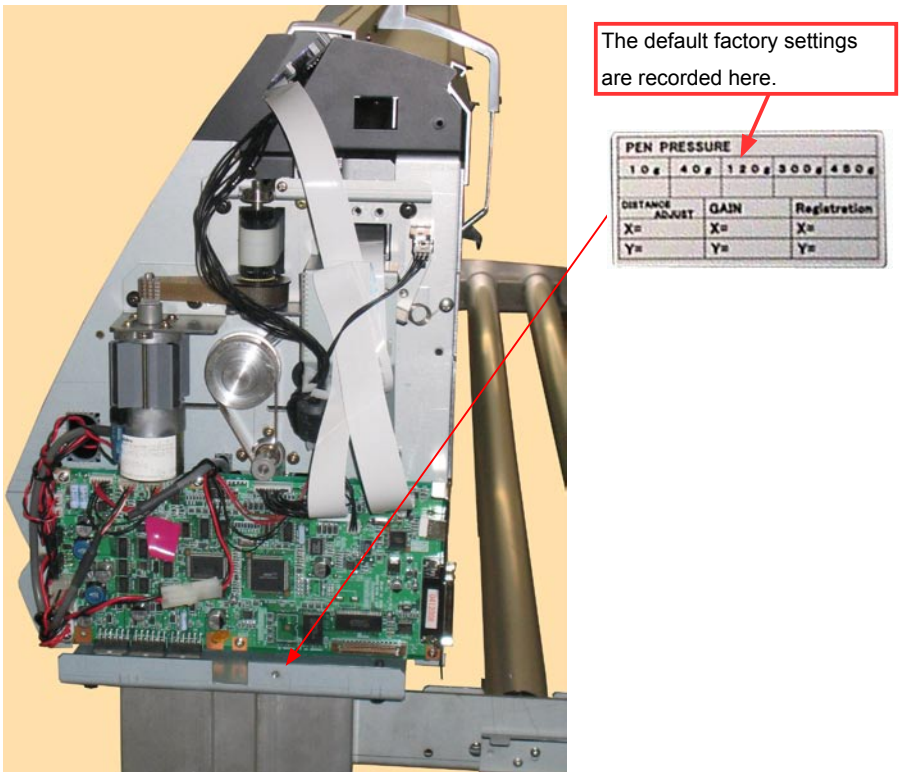
FC8000-160



7.3.2 Explanation of the Values of the Main Board Settings

(Default factory settings)

The default factory settings are recorded in the location shown below.



The contents of an example record are shown below.

25	47	100	228	346
X= 0	X= 80	X= -		
Y= 4	Y= 50	Y= -		

Explanation of the values

Pen force values				
10 g	40g	120 g	300 g	450 g (400g)

Distance adjustment values	Gain adjustment values	Auto registration mark position adjustment values
X	X	X
Y	Y	Y

You can input the same values when you have replaced the main board without making any adjustments.

If you have changed any values by making adjustments, record those values for the next maintenance check.

7.3.3 Clearing the Non-Volatile RAM

When you replace the main board, you must clear the Non-Volatile RAM (NOV-RAM).

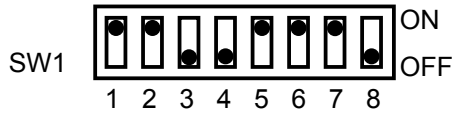
If you clear the Non-Volatile RAM, you will lose the setup parameters for each adjustment.

Input the adjustment values to the main board after you clear the Non-Volatile RAM.

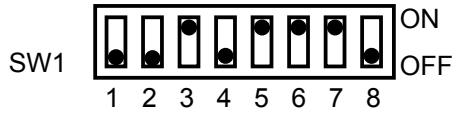
How to clear the Non-Volatile RAM.

(1) Set SW1 to the NOV-RAM clear mode as shown below.

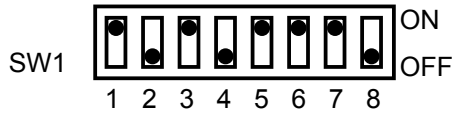
FC8000-60



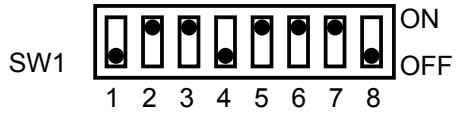
FC8000-75



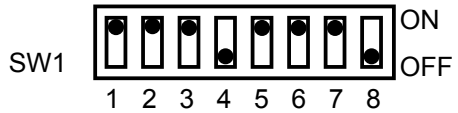
FC8000-100



FC8000-130

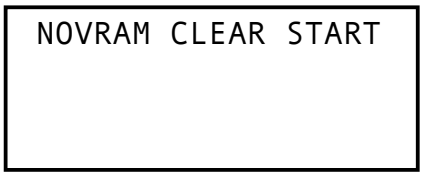


FC8000-160



(2) Turn on the power to the plotter.

(3) The NOVRAM CLEAR START menu appears. The plotter immediately starts to clear the parameters on the NOV-RAM, and then sets the default values.

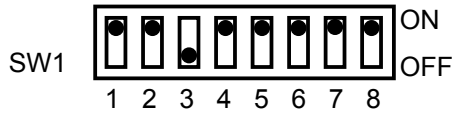


(4) When the programming is complete, the NOVRAM CLEAR COMPLERE menu appears.

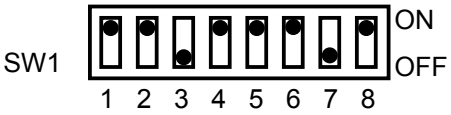
(5) Turn off the power to the plotter.

(6) Return the SW1 setting to the normal mode as shown below.

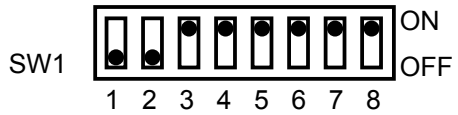
FC8000-60



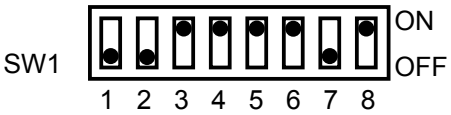
FC8000-60 (2-Pen Model)



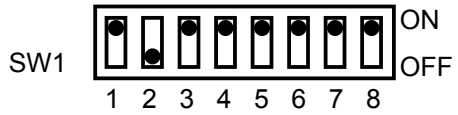
FC8000-75



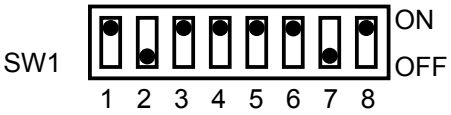
FC8000-75 (2-Pen Model)



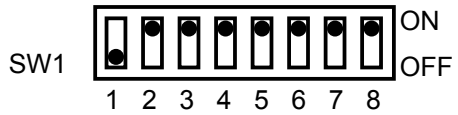
FC8000-100



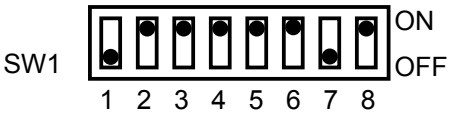
FC8000-100 (2-Pen Model)



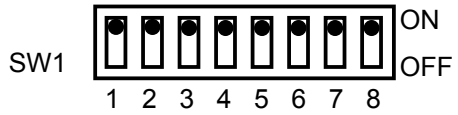
FC8000-130



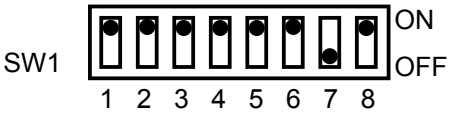
FC8000-130 (2-Pen Model)



FC8000-160



FC8000-160 (2-Pen Model)



7.3.4 How to Enter the Adjustment Menu

(1) Turn on the power while pressing the FAST and ENTER keys.

Or

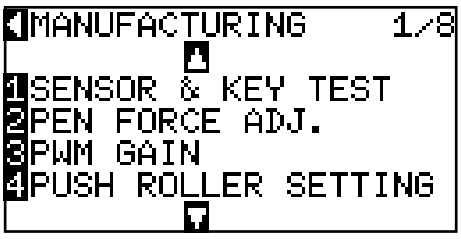
After turning on the power, press the FAST key and the ENTER key simultaneously within 2 seconds.

(2) Load a sheet of paper in the plotter.

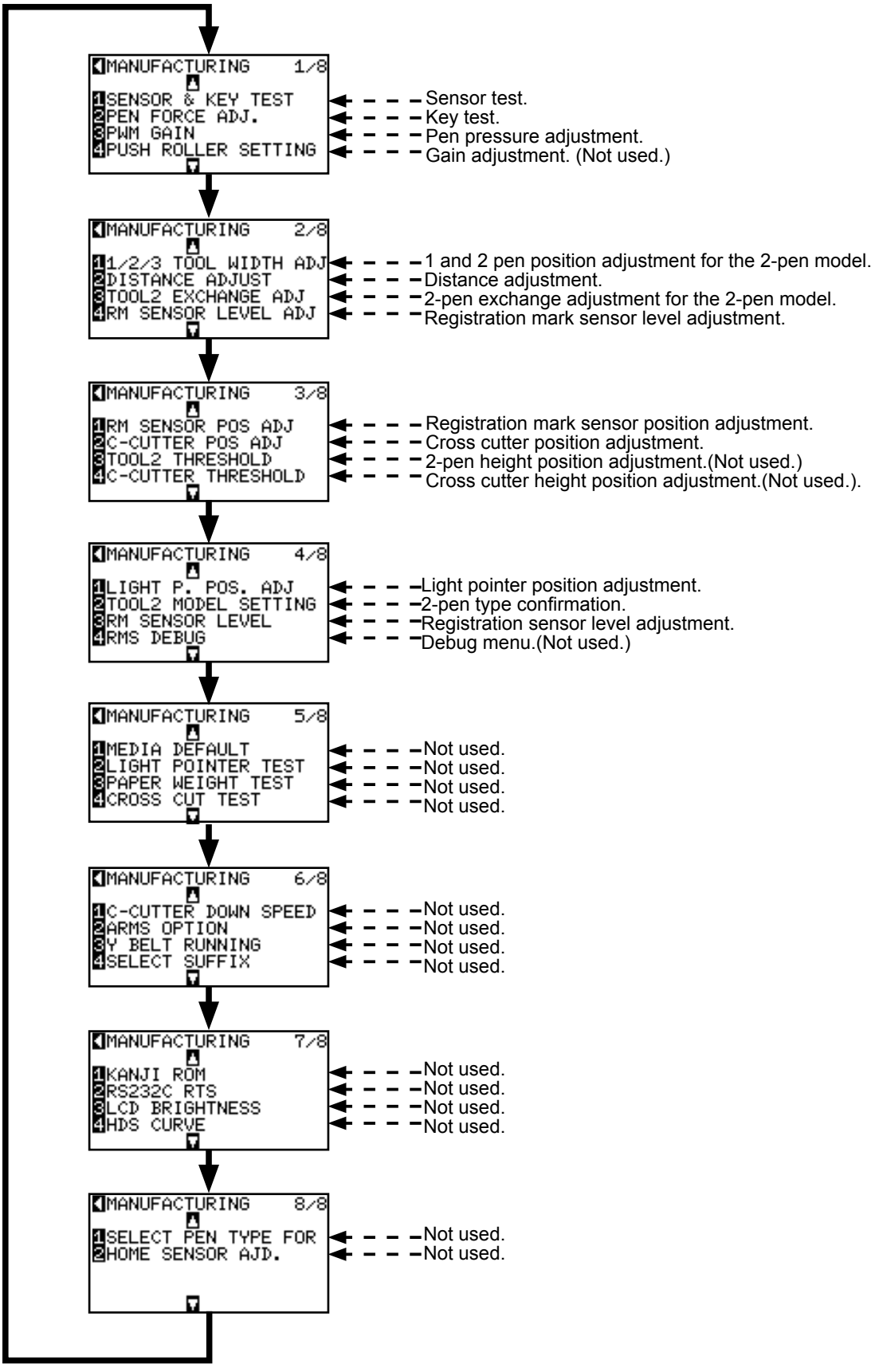
(3) The plotter displays the menu shown below.

(4) Press the MENU key to display the menu shown below.

(5) Press the Left Position key to display the adjustment menu shown below.



Adjustment Menu List



7.3.7 Adjusting the Pen Force

This adjustment will set the pen force.

If you replace the main board, use the following procedure to input the recorded adjustment values.

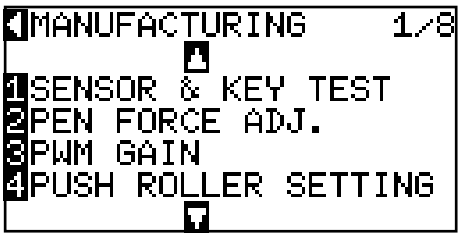
If you replace the moving coil and/or the pen block assembly, you must adjust the pen force using the following procedure.

How to adjust the pen force

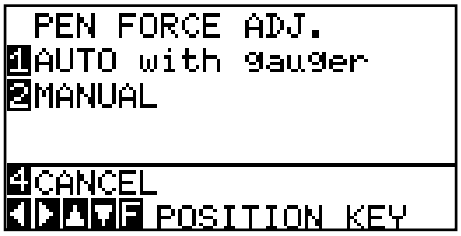
(1) Mount a 0.9 mm diameter cutter pen in the pen holder.

(2) Load a sheet of paper in the plotter.

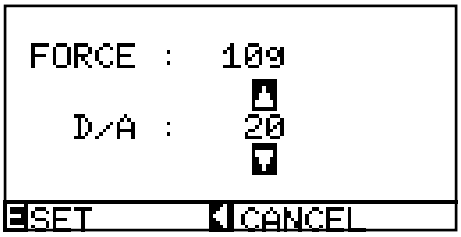
(3) Enter the adjustment menu (see Section 7.3.6).



(4) Press the F2 key to display the menu shown below.

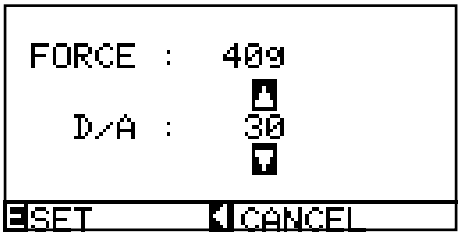


(5) Press the F2 key to display the menu shown below.
Don't select AUTO!



(6) The pen is lowered. If you have replaced the moving coil and/or the pen block assembly, use the force gauge to measure the actual force. If you have only replaced the main board, input the adjustment values that were recorded.
Use the UP ARROW key or DOWN ARROW key to change the force setting. The number on the LCD will increase or decrease. If you have replaced the moving coil and/or the pen block assembly, measure the actual pen force again.
If you replaced the moving coil and/or the pen block assembly, adjust the 10g-pen force. If the measured value is within the specification range (10±2g) or if you have input the recorded value, press the ENTER key to store the setting. The next specified pen force appears.

(7) Adjust the 40g-pen force. If the measured value is within the specification range (40±4g) or if you have input the recorded value, press the ENTER key to store the setting. The next specified pen force appears.



(8) Adjust the 120g-pen force. If the measured value is within the specification range (120±10g) or if you have input the recorded value, press the ENTER key to store the setting. The next specified pen force appears.

(9) Adjust the 300g-pen force. If the measured value is within the specification range (300±20g) or if you have input the recorded value, press the ENTER key to store the setting. The next specified pen force appears.

(10) Adjust the 400 g-pen force. If the measured value is within the specification range or if you have input the recorded value, press the ENTER key to store the setting.

Note: When adjusting the pen force, it is important to do it quickly. Delaying the pen force adjustment changes the temperature of the actuator and causes artificially lower readings. When this happens the actual pen force may be higher than the specification. This is especially true for the upper pen force adjustment.

(11) Press the NEXT key to complete this adjustment.

(12) Turn off the power to exit from the adjustment menu.

Specification of the actual pen force

Specified pen force	Actual force range
	FC8000
10g	8 to 12g
40g	36 to 44g
120g	110 to 130g
300g	280 to 320g
400g	380 to 420g

7.3.8 Adjusting the Distance Accuracy

This adjustment will set the distance accuracy.

If you replace the main board, use the following procedure to input the recorded adjustment values.

If you replace the drive roller, you must adjust the distance accuracy using the following procedure.

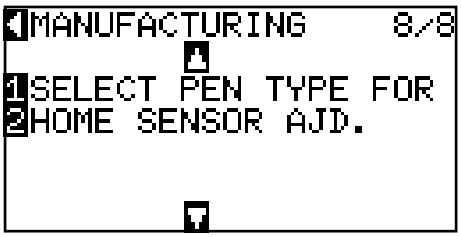
How to adjust the distance accuracy

(1) Enter the adjustment menu (see Section 7.3.4).

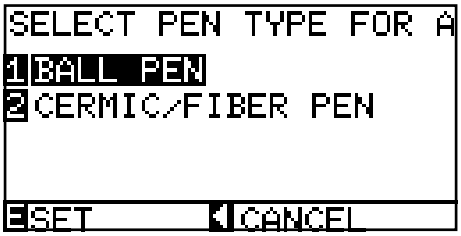
(2) Load an A2 or larger size sheet of paper in the plotter.

(3) Mount a fiber tip pen in the pen holder.

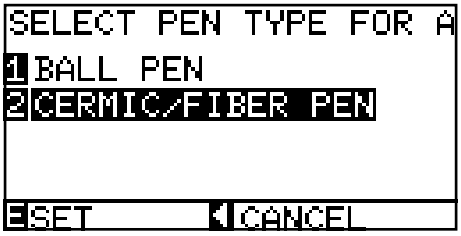
(4) Press the UP arrow or Down arrow key until the menu shown below is displayed.



(5) Press the F1 key to display the menu shown below.

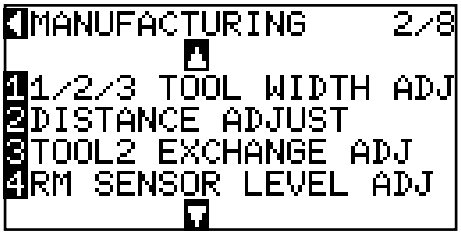


(6) Press the F2 key to select the fiber tip pen the menu shown below.

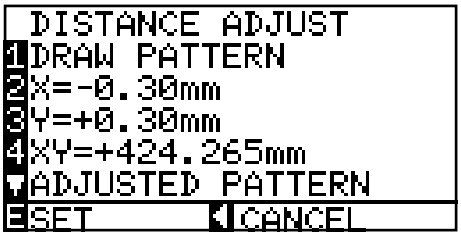


(7) Press the ENTER key to set the fiber tip pen.

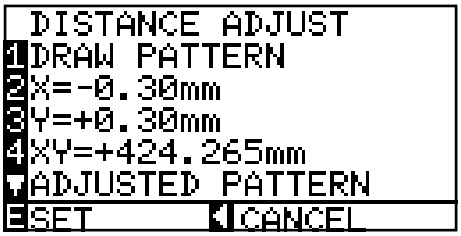
(8) Press the UP arrow or Down arrow key until the menu shown below is displayed.

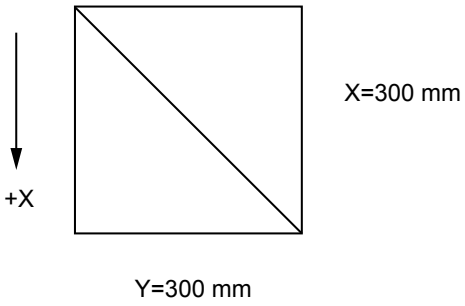


(9) Press the F2 key to display the menu shown below.



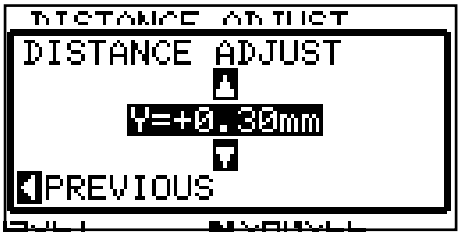
(10) Press the F1 key to start to draw the adjustment pattern. The plotter immediately plots the adjustment pattern, and the following menu appears.





(11) Remove the paper and measure the Y-axis distance. If you have replaced the main board only, use the recorded values.

(12) Press the F3 key to display the menu shown below, and then input the value for the Y-axis distance.



(13) Input the values using the POSITION keys.

The UP and DOWN ARROW keys are used to change the Y-axis or X-axis adjustment value.

If you input the measured value use the following formula to calculate the input value.

The formula of the input value is as follows:

Input value for X-axis = 300 mm - measured X distance

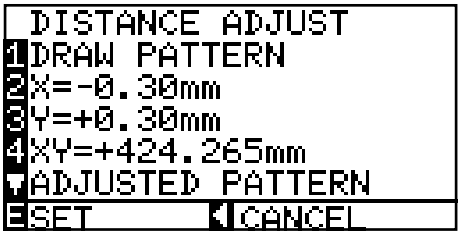
Input value for Y-axis = 300 mm - measured Y distance

For example:

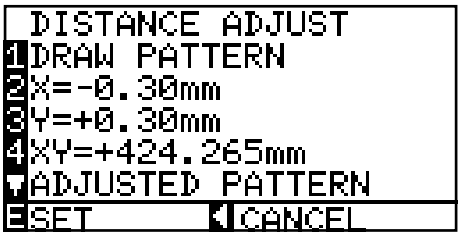
If you measured 299.0 mm for the Y-axis then input +0.10 mm for the adjustment value.

Adjustable range: -9.9 mm to +9.9 mm

(14) Press the left arrow key to display the menu shown below. (Adjusted value will be displayed.)

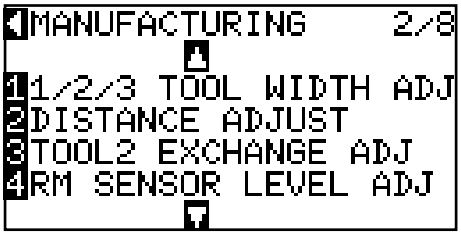


(15) Press the ENTER key to store the setting.



(16) Press the down arrow key to draw the adjusted pattern, and then confirm the distance adjustment.

(17) If you wish to complete this adjustment, press the left arrow key.



(18) Turn off the power to exit from the adjustment menu.

7.3.9 Adjusting the Registration Mark Sensor Sensitivity

If you replace the main board, you need to adjust the sensitivity.

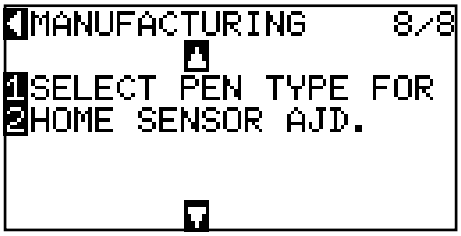
How to adjust the registration mark sensor sensitivity

(1) Enter the adjustment menu (see Section 7.3.4).

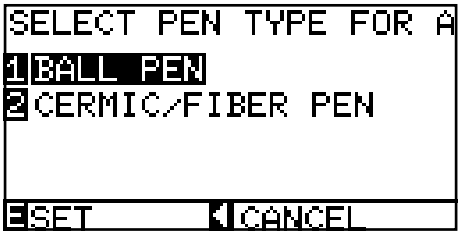
(2) Load an A2 or larger size sheet of paper in the plotter. The paper color must be white, and it is recommended that high-quality paper made for ink-jet printers be used.

(3) Mount a fiber tip pen in the pen holder.

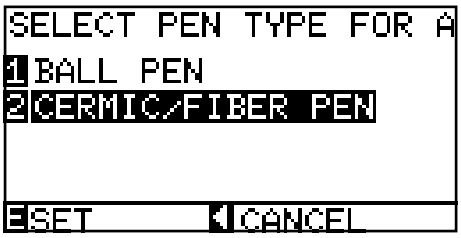
(4) Press the UP arrow or Down arrow key until the menu shown below is displayed.



(5) Press the F1 key to display the menu shown below.

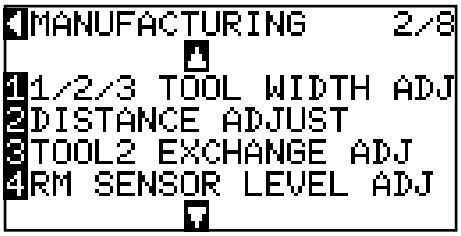


(6) Press the F2 key to select the fiber tip pen.

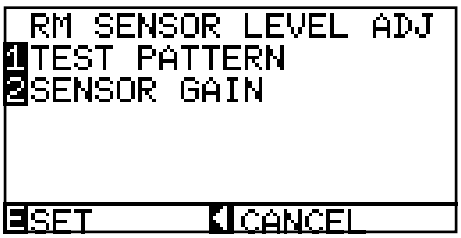


(7) Press the ENTER key to set the fiber tip pen.

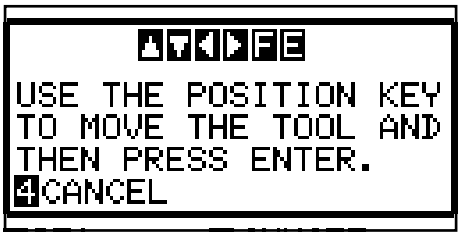
(8) Press the UP arrow or Down arrow key until the menu shown below is displayed.



(9) Press the F4 key to display the menu shown below.



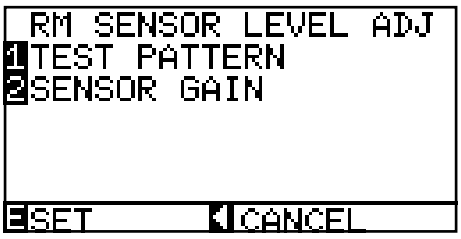
(10) Press the F1 key to draw the cross pattern.



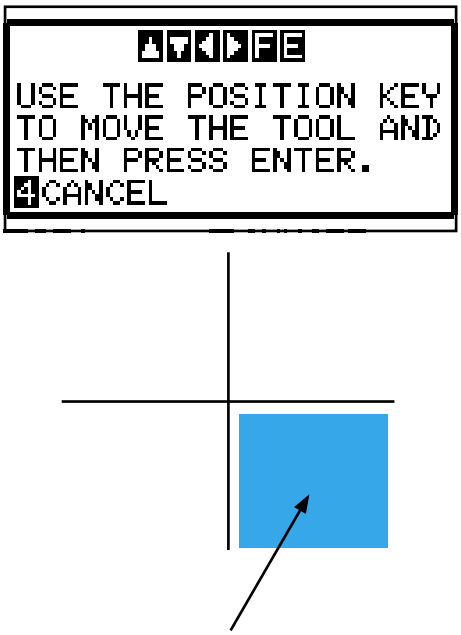
(11) Use the ARROW keys to move the pen to an open area to plot the cross pattern.

(12) Press the ENTER key to plot the cross pattern.

(13) Press the F2 key to start the registration mark sensor gain adjustment.

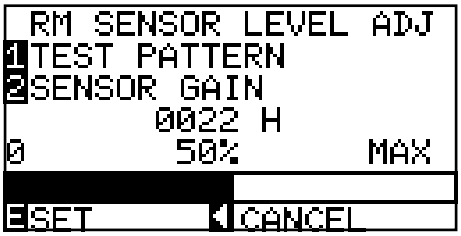


(14) Use the ARROW keys to move the pen to bottom right area of the cross pattern.



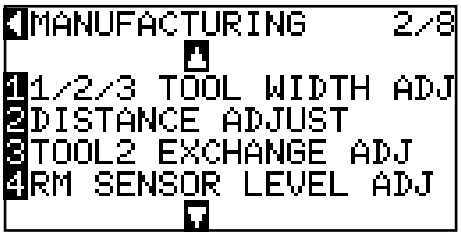
Move the pen tip position to this area.

(15) Press the ENTER key to start the registration mark sensor gain adjustment. The plotter immediately adjusts the registration mark sensor gain automatically. The plotter displays the menu shown below.



Confirm that the output level is between 50% to 60%.

(16) Press the ENTER key to store the setting.



(17) Turn off the power to exit from the adjustment menu.

7.3.10 Adjusting the Offset of the Auto-Registration Mark Sensor

If you replace the Auto-registration mark sensor or the main board, you need to adjust the offset.

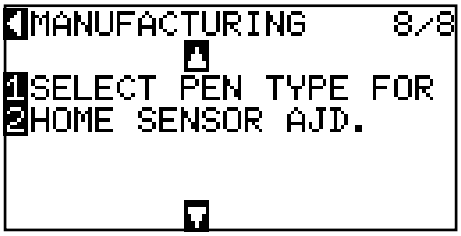
How to adjust the auto-registration mark sensor

(1) Enter the adjustment menu (see Section 7.3.4).

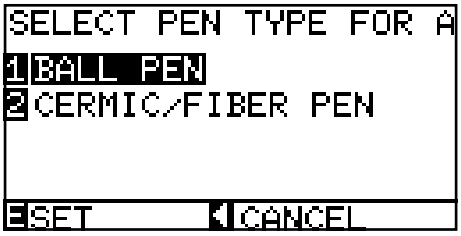
(2) Load an A2 or larger size sheet of paper in the plotter. The paper color must be white, and it is recommended that high-quality paper made for ink-jet printers be used.

(3) Mount a fiber tip pen in the pen holder.

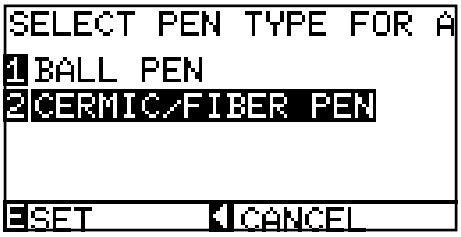
(4) Press the UP arrow or Down arrow key until the menu shown below is displayed.



(5) Press the F1 key to display the menu shown below.

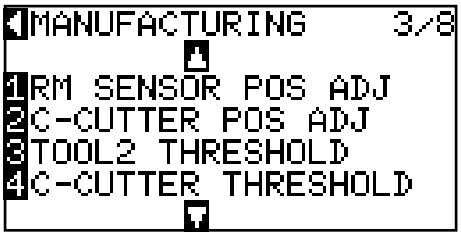


(6) Press the F2 key to select the fiber tip pen.



(7) Press the ENTER key to set the fiber tip pen.

(8) Press the UP arrow or Down arrow key until the menu shown below is displayed.



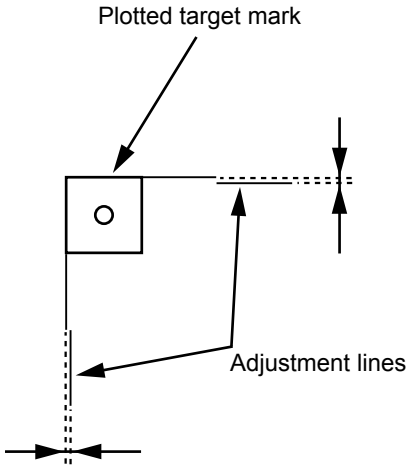
(9) Press the F1 key to display the menu shown below.

(10) Press the F1 key to display the menu shown below.

(11) Use the ARROW keys to move the pen to an open area to plot the adjustment pattern.

(11) Use the ARROW keys to move the pen to an open area to plot the adjustment pattern.

(12) Press the ENTER key to plot the adjustment pattern shown below.



(13) The plotter immediately adjusts the registration mark sensor position automatically, and adds a vertical line and a horizontal line to the scanned plotted pattern.

(14) Measure the offset between the lines and confirm that they are within 0.25 mm.

(15) Press the ENTER key to store the setting.

(16) Turn off the power to exit from the adjustment menu.

7.3.11 Adjusting the Cross Cutter Home Position

This adjustment will set the cross cutter home position value.

If you replace the main board, use the following procedure to input the recorded adjustment values.

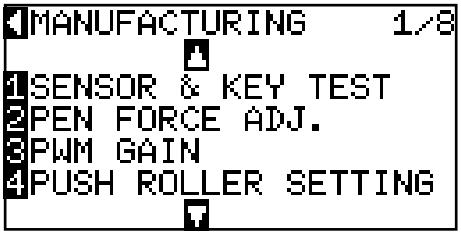
How to adjust the cross cutter home position

(1) Enter the adjustment menu (see Section 7.3.4).

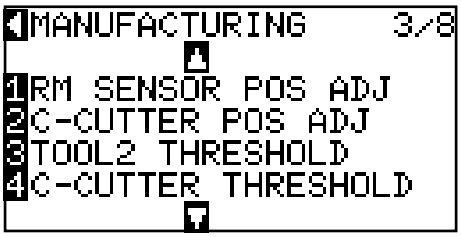
(2) Load an A3 or larger size sheet of paper in the plotter. The paper must cover the front and rear media sensors.

(3) Lower the media set lever to raise the pinch rollers, and then raise the media set lever to detect the paper size.

The menu shown below is displayed after the media set lever is raised.



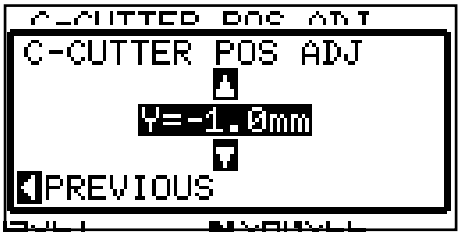
(4) Press the down arrow key until the menu shown below is displayed.



(5) Press the F2 key to display the menu shown below.

(6) Press the F1 key to display the menu shown below.

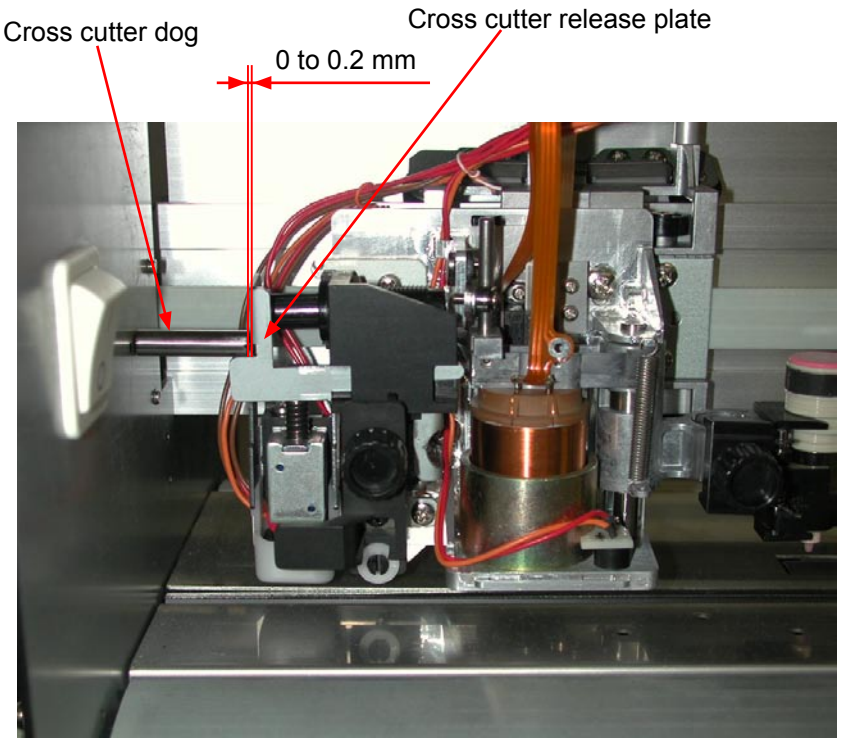
The pen head moves to the left side of the cross cutter home position.



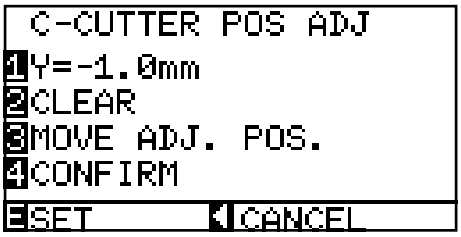
(7) Confirm the gap between the cross cutter dog and the cross cutter release plate.

(8) Adjust the gap to a value in the range of 0 mm to 0.2 mm.

Press the UP or DOWN ARROW key to adjust the gap.



(9) Press the left arrow key to display the menu shown below.



(10) Press the F4 key to confirm the gap.

If the cross cutter dog presses on the cutter release plate too much, a position alarm error will be displayed.

At this time reduce the C-CUTTER POS ADJ value.

(11) Press the ENTER key to store the setting.

(12) Turn off the power to exit from the adjustment menu.

7.3.12 Adjusting the Offset of the Light Pointer Position

If you replace the light pointer or the main board, you need to adjust the offset.

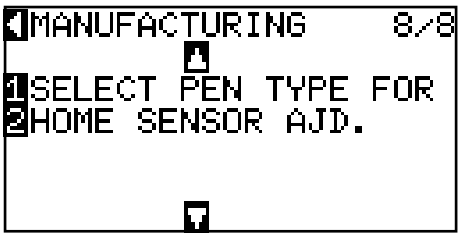
How to adjust the offset of the light pointer position

(1) Enter the adjustment menu (see Section 7.3.4).

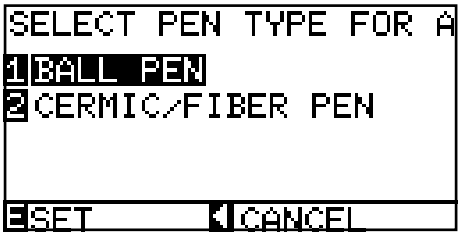
(2) Load an A2 or larger size sheet of paper in the plotter.

(3) Mount a fiber tip pen in the pen holder.

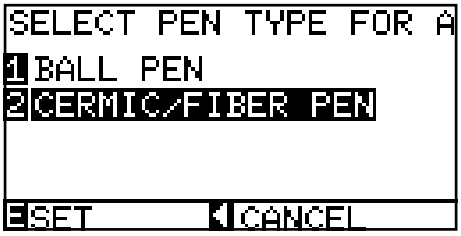
(4) Press the UP arrow or Down arrow key until the menu shown below is displayed.



(5) Press the F1 key to display the menu shown below.

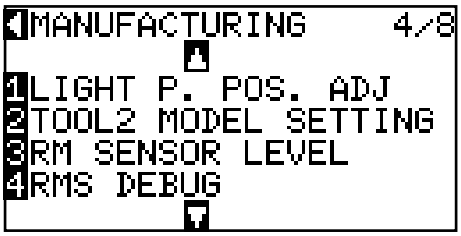


(6) Press the F2 key to select the fiber tip pen the menu shown below.

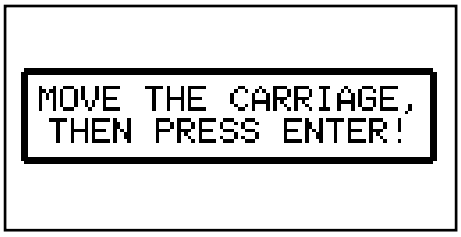


(7) Press the ENTER key to set the fiber tip pen.

(8) Press the UP arrow or Down arrow key until the menu shown below is displayed.



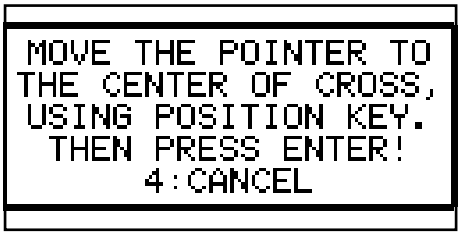
(9) Press the ENTER key to display the menu shown below.

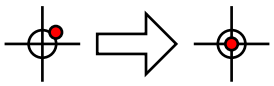


(10) Use the POSITION keys to move the pen to an open area to plot the adjustment pattern.

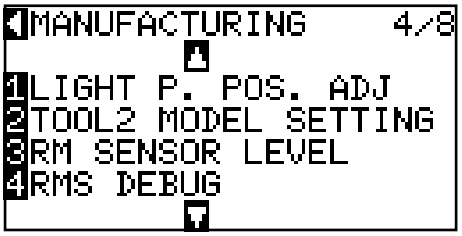
(11) Press the ENTER key to plot the adjustment pattern shown below.

(12) Move the light pointer to the center of the adjustment pattern using the POSITION keys.





(13) Press the ENTER key to register the position.



(14) Turn off the power to exit from the adjustment menu.

7.3.13 Confirming the 2-Pen Model (2-pen model)

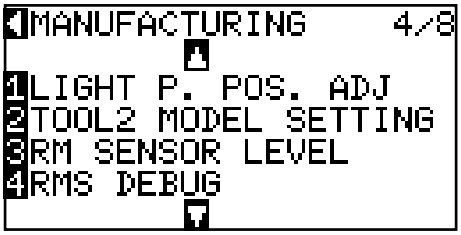
This setting will confirm that the plotter is a 2-pen model.

If you replace the main board, use the following procedure to make the 2-pen model setting.

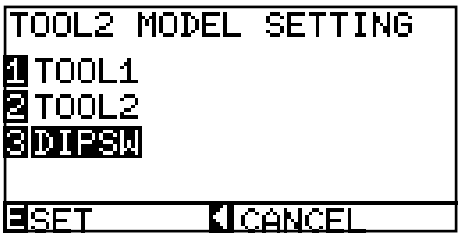
(1) Load an A2 or larger size sheet of paper in the plotter.

(2) Enter the adjustment menu (see Section 7.3.4).

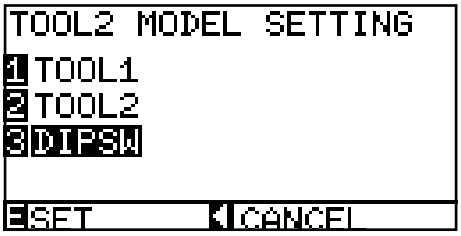
(3) Press the Up or Down position key until the menu shown below is displayed.



(4) Press the F2 key to display the menu shown below.



(5) Press the F3 key to select the DIPSW.

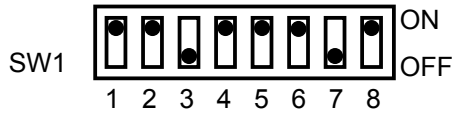


(6) Press the ENTER key to set the DIPSW.

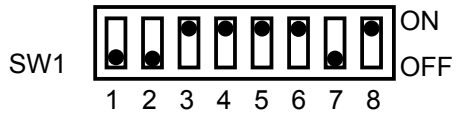
(7) Turn off the power to exit from the adjustment menu.

(8) Confirm the DIP-switch 7 of SW1 is OFF if the 2-pen system.

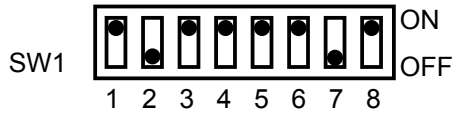
FC8000-60 (2-Pen Model)



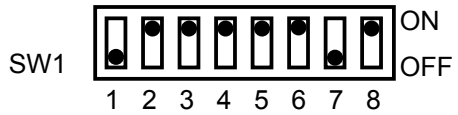
FC8000-75 (2-Pen Model)



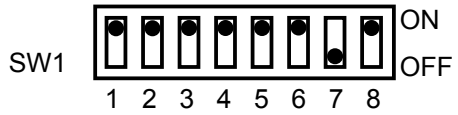
FC8000-100 (2-Pen Model)



FC8000-130 (2-Pen Model)



FC8000-160 (2-Pen Model)



7.3.14 Adjusting the Pen Exchange Y Direction Value (2-pen model)

This adjustment will set the pen exchange Y direction value.

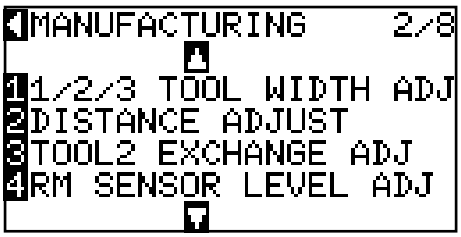
This value is used for the 2nd pen pen exchange.

If you replace the main board, use the following procedure to input the recorded adjustment values.

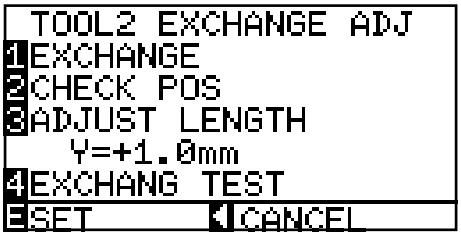
(1) Confirm that the DIP switch 7 of SW1 is OFF. (2-pen model mode)

(2) Enter the adjustment menu (see Section 7.3.4).

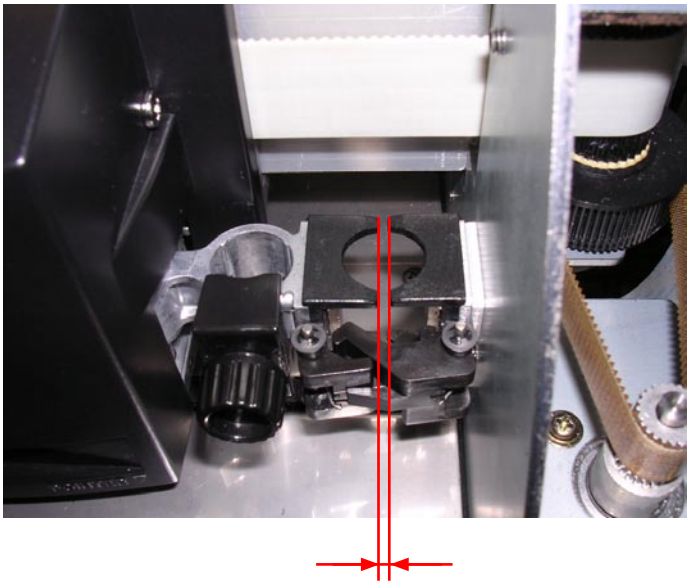
(3) Press the Up or the Down position key until the menu shown below is displayed.



(4) Press the F3 key to display the menu shown below.

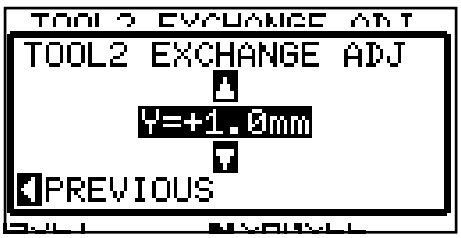


(5) Press the F2 key to move the pen carriage to the exchange position.



This gap should be 1.1 mm.

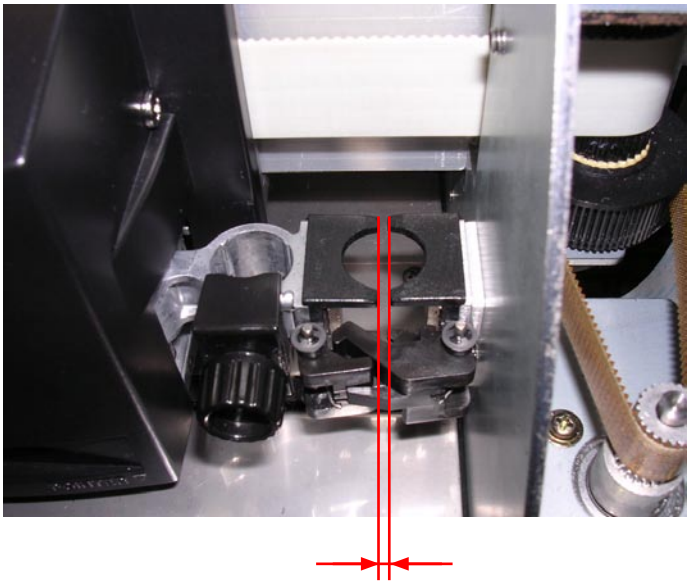
(6) Press the F3 key to display the following menu to adjust the gap.



(7) Adjust gap using the up or the down position key.

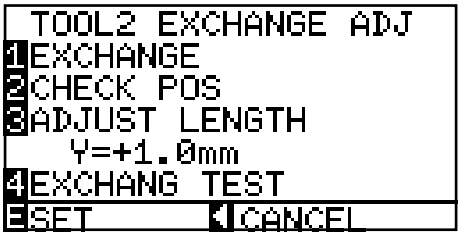
(8) Measure the gap between the 2nd pen holder and the 2nd pen station.

(9) Press the ENTER key when the gap became to 1.1 mm.



This gap should be 1.1 mm.

(10) Mount a fiber tip pen in the 2nd pen station.



(11) Press the F4 key to confirm that the pen exchanging is performed correctly.

(12) If the pen exchanging is performed correctly, press the ENTER key to store the setting and complete the adjustment.

7.3.15 Adjusting the Spacing Between Pen 1 and Pen 2 (2-pen model)

This adjustment will set the spacing between pen 1 and pen 2.

If you replace the main board, use the following procedure to input the recorded adjustment values.

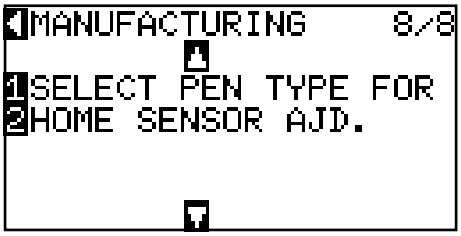
If you replace the pen block, you must adjust this value using the following procedure.

(1) Enter the adjustment menu (see Section 7.3.4).

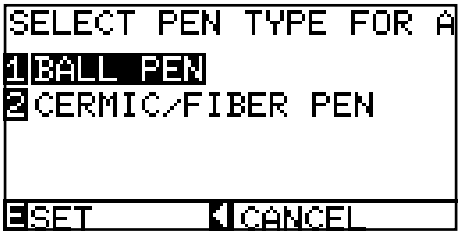
(2) Load an A2 or larger size sheet of paper in the plotter.

(3) Mount the fiber tip pens in the 1-pen holder and 2-pen station.

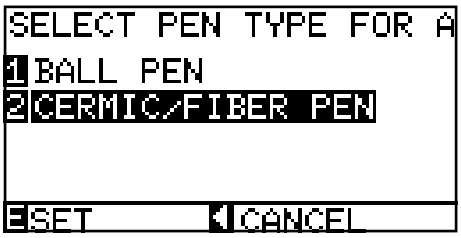
(4) Press the UP arrow or Down arrow key until the menu shown below is displayed.



(5) Press the F1 key to display the menu shown below.

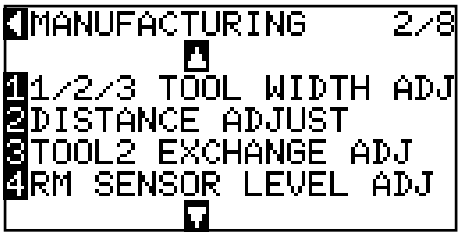


(6) Press the F2 key to select the fiber tip pen the menu shown below.

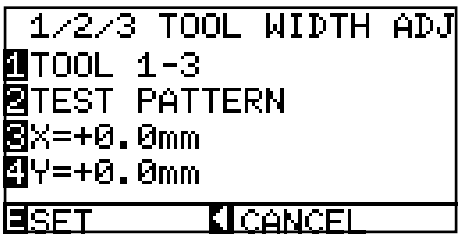


(7) Press the ENTER key to set the fiber tip pen.

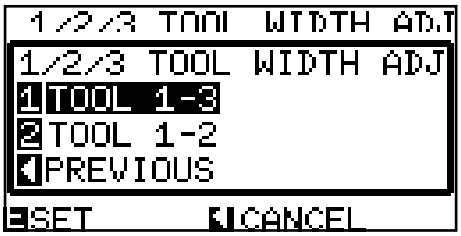
(8) Press the UP arrow or Down arrow key until the menu shown below is displayed.



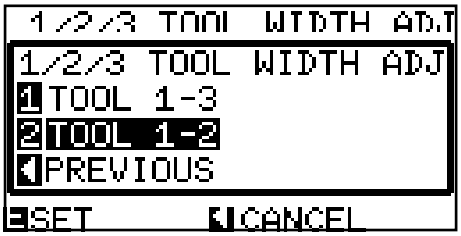
(9) Press the F1 key to display the menu shown below.



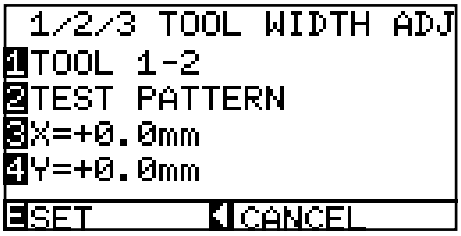
(10) Press the F1 key to display the menu shown below.



(11) Press the F2 key to select the TOOL 1-2.



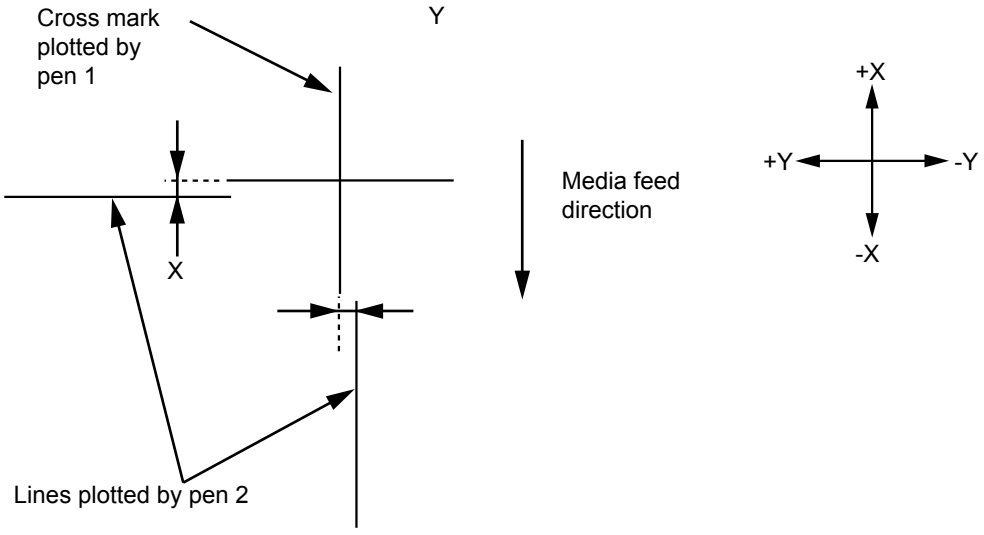
(12) Press the ENTER key to display the menu shown below.



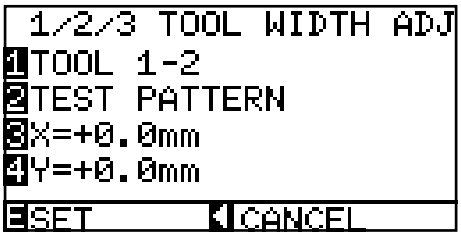
(13) Press the F2 key to display the menu shown below.

(14) Use the ARROW keys to move the pen to an open area to plot the adjustment pattern.

(15) Press the ENTER key to plot the cross marks by pen 1 and pen 2 shown below.

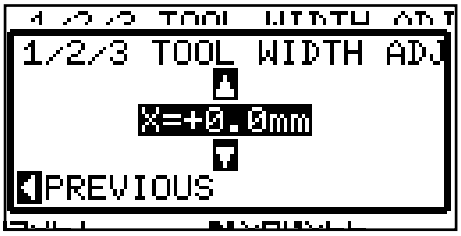


(16) When they have been plotted, the menu shown below is displayed.



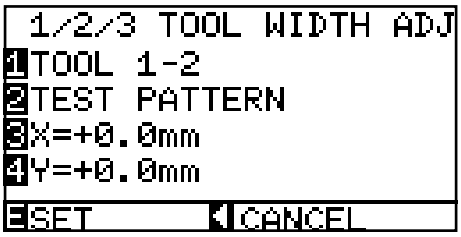
(17) Measure the offset between the pen 1 cross mark and the pen 2 lines.

(18) Press the F3 key to display the menu shown below.

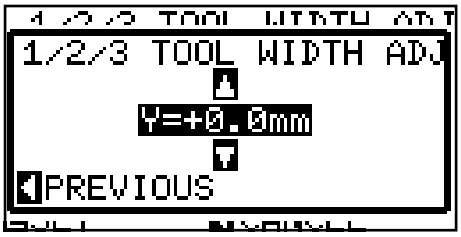


(19) Set the X-offset value. Press the UP ARROW key or DOWN ARROW key to change the number based on the pen 1 cross mark.

(20) Press the left position key when the X direction is adjusted.



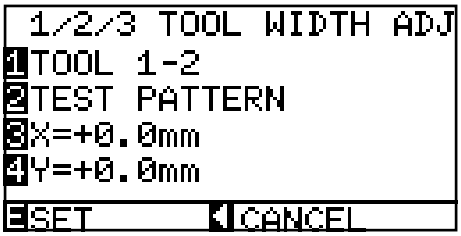
(21) Press the F4 key to display the menu shown below.



(22) Set the Y-offset value. Press the UP ARROW key or DOWN ARROW key to change the number based on the pen 1 cross mark.

(23) Press the left position key when the Y direction is adjusted.

(24) Press the F2 key. Verify that the plotted pen 1 cross mark is located at the center of the plotted pen 2 lines.



(25) If the plotted cross marks are in the correct positions, press the ENTER key to store the setting and complete the adjustment.

7.4 Upgrading the System Firmware

To upgrade the system firmware you need to have the following files. In addition, you need to use a computer and USB cable.

- FC8000_V***.X :FC8000 firmware
- SEND.EXE :Utility to transfer files using Windows®
- OPS662 :USB Driver software for the FC8000

Preparation

Install the USB Driver software to your computer before upgrading the system firmware.

How to upgrade the system firmware

(1) Connect the computer and the plotter via the USB interface.

(2) Load a sheet of paper in the plotter.

(3) Turn on the power while pressing the LEFT ARROW and RIGHT ARROW keys.

Or

After turning on the power, press the LEFT ARROW key and the RIGHT ARROW key simultaneously within 2 seconds.

(4) The plotter displays the menu shown below.

```
UPDATE ?     No
```

(5) Select “Yes” using the UP ARROW or DOWN ARROW key.

```
UPDATE ?     Yes
```

(6) Press the ENTER key to display the menu shown below.

```
PLEASE SEND PRG.
```

(7) Send firmware to the plotter from the computer.

Execute SEND.EXE.

Select the system firmware file from the SEND.EXE menu.

Output the system firmware file to the FC8000.

(8) The following menu is displayed while data is being received.

```
 **KB RECEIVED
```

(9) The plotter will start the initialization routine when all the data has been received. The firmware version is displayed during the initialization routine. Check the firmware version that you upgraded.

(10) Turn off the power.

8. TROUBLESHOOTING

8.1 The Plotter is Turned On But Doesn't Operate

Symptom	Verification item	Solution
Both USER1 and USER2 lamp on the control panel does not light. Nothing is displayed on the LCD panel.	(1) Is the plotter being supplied with power?	No .....Check that the power cord is securely connected to the plotter's AC line inlet. Yes....Verify item (2).
	(2) Is the FFC707102 flexible cable securely connected to the main board and the control panel?	No .....Connect the flexible cable securely. Yes....Verify item (3).
	(3) Is the FFC707102 flexible cable broken?	No .....Verify item (4). Yes....Replace the FFC707102 flexible cable.
	(4) Is the AC line electrical output correct?	No .....Change the AC line. Yes....Verify item (5).
	(5) Does the power supply unit have a 40 V output?	No .....Replace the power supply unit. Yes....Replace the main board.

8.2 Media Loading Operations

Symptom	Verification item	Solution
The media drops to the front of the plotter.	(1) Is the front edge of the media curled?	Yes....Replace the media. No .....Verify item (2).
	(2) Is the front media sensor dirty?	Yes....Clean the front media sensor. No .....Verify item (3).
	(3) Is the front media sensor cable securely connected to the main board and the sensor?	Yes....Replace the front media sensor. No .....Connect the cable securely.
The media drops to the rear of the plotter.	(1) Is the rear edge of the media curled?	Yes....Replace the media. No .....Verify item (2).
	(2) Is the rear media sensor dirty?	Yes....Clean the rear media sensor. No .....Verify item (3).
	(3) Is the rear media sensor cable securely connected to the main board and the sensor?	Yes....Replace the rear media sensor. No .....Connect the cable securely.
The plotter displays “LOAD MEDIA!” when media has been loaded.	(1) Does the cam sensor plate block the cam sensor?	Yes....Check the cam sensor plate and attach it at the correct position. No .....Verify item (2).
	(2) Is the cam sensor cable securely connected to the main board and the sensor?	No .....Connect the cable securely. Yes....Replace the cam sensor board.
The plotter can’t recognize the Y direction of the media size.	(1) Is there any dust on the pinch roller sensor?	Yes....Clean the pinch roller sensor. No .....Verify item (2).
	(2) Is the pinch roller sensor flexible cable securely connected to each connector?	Yes....Replace the pinch roller sensor. No .....Connect the cable securely.
The plotter can’t recognize the X direction of the media size.	(1) Is there any dust on the front media sensor and the rear media sensor?	Yes....Clean the front media sensor and the rear media sensor. No .....Verify item (2).
	(2) Are the front media sensor and the rear media sensor cables securely connected to each connector?	No .....Connect the cables securely. Yes....Replace the sensor(s).
The media is fed at an angle.	(1) Are the pinch rollers worn down?	Yes....Replace the pinch roller(s). No .....Verify item (2).
	(2) Is there anything on the drive roller?	Yes....Clean the drive roller with a brush. No .....Verify item (3).
	(3) Do the pinch rollers have the correct pressure?	No .....Replace the pinch roller spring(s). Yes....Verify item (4).
	(4) Is the drive roller worn down?	Yes....Replace the drive roller. No .....Verify item (5).
	(5) Is the drive roller attached correctly?	Yes....Replace the bearing of the drive roller. No .....Attach the drive roller correctly.

8.3 Cutting Operations

Symptom	Verification item	Solution
The cut line is crooked.	(1) Does the blade turn well in the blade holder?	No .....Replace the blade holder. Yes....Verify item (2).
	(2) Do the X and Y drive motor belts have the correct tension?	No .....Adjust the tension. No .....Verify item (3).
	(3) Is the Y belt attached correctly?	No .....Attach it correctly. Yes....Verify item (4).
	(4) Is the pen block attached correctly?	No .....Attach it correctly. Yes....Verify item (5).
	(5) Is the pen arm shaky?	Yes....Adjust the pen arm shaft slider tension.
The blade skips and does not completely cut lines that should be solid.	(1) The blade is extended too far.	Adjust the blade length.
	(2) The cutting SPEED is too high.	Adjust the SPEED setting.
	(3) Verify the pen force.	Adjust the pen force.
	(4) Verify the pen block height.	Adjust the pen block height.
The cutting position is shifted.	(1) The media is skewing.	Confirm the position of the pinch roller(s).
	(2) The X or Y belt tension is incorrect.	Adjust the belt tension.
	(3) Is the Y belt installed correctly?	Install the Y belt correctly.
	(4) Is there any play in the Y drive pulley?	Replace the Y drive pulley.

8.4 Error Messages

8.4.1 Hardware Error Messages

Error code	Error Display	Cause	Verification item	Solution
E01001	E0100X HARDWARE TLB ERROR 00000000 H	Main board is defective.		Replace the main board.
E01002				
E01003				
E01004				
E01005				
E01006	E01006 HARDWARE ADDRESS LOAD ERROR 00000000 H			
E01007	E01007 HARDWARE ADDRESS STORE ERROR 00000000 H			
E01008	E01008 HARDWARE ILLEGAL TRAPA 00000000 H			
E01009	E01009 HARDWARE ILLEGAL CODE 00000000 H			
E01010	E01010 HARDWARE ILLEGAL SLOT 00000000 H			
E01011	E01011 HARDWARE ILLEGAL VECTOR 00000000 H			
E01012	E01012 HARDWARE RAM ERROR 00000000 H			
E01013	E01013 HARDWARE BUFFER RAM ERROR 00000000 H			
E01014	E01014 HARDWARE SPEED ALARM	X or Y motor is defective.		Replace the X or Y motor.
E01015	E01015 HARDWARE OVER CURRENT	Or the main board is defective.		Or replace the main board.

Error code	Error Display	Cause	Verification item	Solution
E01017	E01017 HARDWARE X POSITION ALARM POWER OFF THEN ON	Load on the motor was too large.	Check the madia.	Do not use heavy media. Use the prefeed function.
		Cutting conditions do not suit the cutting medium.	Cutting conditions.	Lower the cutting SPEED and/or the cutting FORCE.
		Movement of the X is being obstructed.	Is there anything blocking the X movement?	Turn off the plotter, remove the obstacle, then turn the plotter back on.
		Excessive load is causing the current to the motor to exceed the rated value.	(1) Does the X move smoothly?	No.....Check and adjust the X belt tension and X motor belt tension. Yes....Verify item (2).
			(2) Is the X flexible cable securely connected? Or Is the X flexible cable broken?	No.....Connect it securely. Yes....Replace the X flexible cable if defective.
		Motor	(3) Does the X-motor turn smoothly?	No.....Replace the X-motor if defective. Yes....Replace the main board if defective.

Error code	Error Display	Cause	Verification item	Solution
E01018	E01018 HARDWARE Y POSITION ALARM POWER OFF THEN ON	Cutting conditions do not suit the cutting medium.	Cutting conditions.	Lower the cutting SPEED and/or the cutting FORCE.
		Movement of the pen carriage is being obstructed.	Is there anything blocking the Y slider?	Turn off the plotter, remove the obstacle, then turn the plotter back on.
		Excessive load is causing the current to the motor to exceed the rated value.	(1) Does the Y slider move smoothly?	No.....Check and adjust the Y belt tension and Y motor belt tension. Yes....Verify item (2).
			(2) Is the Y flexible cable securely connected? Or Is the Y flexible cable broken?	No.....Connect it securely. Yes....Replace the Y flexible cable if defective.
		Home sensor or sensor plate adjustment.	(3) Is the Y home sensor plate position correct?	No.....Check and adjust the X-home sensor position. Yes....Replace the X-home sensor if defective
			(4) Is the Y home sensor position correct?	No.....Check and adjust the X-home sensor position. Yes....Replace the X-home sensor if defective.
		Motor	(5) Does the X-motor turn smoothly?	No.....Replace the X-motor if defective. Yes....Replace the main board if defective.
E01019	E01019 HARDWARE XY POSITION ALARM POWER OFF THEN ON	Load on the motor was too large.	Is there anything blocking the X or Y movement?	Turn off the plotter, remove the obstacle, then turn the plotter back on.

8.4.2 Error Messages in GP-GL Command Mode

Error code	Error Display	Cause	Verification item	Solution
E02001	E02001 GP-GL ERROR 1 COMMAND ERROR! E CONFIRM	The plotter received an unrecognizable command.	(1) Did the plotter receive an unrecognizable command?	No.....Verify item (2) Yes....Send correct data to plotter.
			(2) Is there any noise on the line?	No.....Verify item (3) Yes....Check the interface cable or move the plotter to another location.
			(3) Has the correct model name been set for the plotter?	No.....Set the correct model name. Configure your software application menu to permit Graphtec plotter control. Re-specify the software application's interface conditions.
E02004	E02004 GP-GL ERROR 4 PARAMETER OVERFLOW! E CONFIRM	• The software configuration regarding the output device has been changed. • The plotter's interface conditions have been changed.	The numeric parameter of an input command exceeds its permissible range.	Configure your software application menu to permit Graphtec plotter control. Re-specify the software application's interface conditions. Set the correct model name if it was incorrect.
E02005	E02005 GP-GL ERROR 5 I/O ERROR! E CONFIRM		An error related to the receipt of data occurred within the interface.	

8.4.3 Error Messages in HP-GL Emulation Mode

If any of the following command errors occur, they are nearly always caused by one of the reasons below:

(1) The software configuration regarding the output device has been changed; or

(2) The plotter's interface conditions have been changed.

When a command error occurs in HP-GL™ emulation mode, therefore, first check the two corresponding points below:

(1) Configure the software to drive your plotter, and ensure that the software's interface conditions are correctly set; and

(2) Ensure that the plotter's interface conditions are set to match those of the software.

Error code	Error Display	Cause	Verification item	Solution
E03001	E03001 HP-GL ERROR 1 INSTRUCTION NOT RECOGNIZED E CONFIRM	An unrecognizable instruction was executed. Execute a recognizable command.	(1) Did the plotter receive an unrecognizable command?	No.....Verify item (2) Yes....Send correct data to plotter.
			(2) Is there any noise on the line?	No.....Verify item (3) Yes....Check the interface cable or move the plotter to another location.
			(3) Has the correct model name been set for the plotter?	No.....Verify item (3) Yes....Check the interface cable or move the plotter to another location.
				No.....Set the correct model name. Configure your software application menu to permit Graphtec plotter control. Re-specify the software application's interface conditions.

Error code	Error Display	Cause	Verification item	Solution
E03002	E03002 HP-GL ERROR 2 WRONG NUMBER OF PARAMETES E CONFIRM	A command was executed with the wrong number of parameters.	Execute the command with the correct number of parameters.	Configure your software application menu to permit Graphtec plotter control. Re-specify the software application's interface conditions. Set the correct model name if it was incorrect.
E03003	E03003 HP-GL ERROR 3 OUT OF RANGE PARAMETES E CONFIRM	A command containing an unusable parameter was specified.	Execute the command with its parameters specified within their permissible ranges.	
E03005	E03005 HP-GL ERROR 5 UNKNOWN CHARACTER SET E CONFIRM	An unrecognizable character set was specified.	Specify a recognizable character set.	
E03006	E03006 HP-GL ERROR 6 POSITION OVERFLOW E CONFIRM	The data being input exceeds the capacity of the plotter's		Execute coordinates within the cutting area.
E03007	E03007 HP-GL ERROR 7 BUFFER OVERFLOW E CONFIRM	Coordinates of command specified out of cutting area.		Adjust the buffer size.
E03010	E03010 HP-GL ERROR 10 INVALID I/O OUTPUT REQUEST E CONFIRM	Other output command was executed while executing an output command.		Check the program.
E03011	E03011 HP-GL ERROR 11 INVALID BYTE FOLLOWING ESC. E CONFIRM	An invalid byte was received after ESC code.		
E03012	E03012 HP-GL ERROR 12 INVALID BYTE IN I/O CONTROL E CONFIRM	Invalid byte was received within device control command.		
E03013	E03013 HP-GL ERROR 13 OUT OF RANGE I/O PARAMETERS E CONFIRM	A parameter outside of the permissible range was specified in the I/O related command.		
E03014	E03014 HP-GL ERROR 14 TOO MANY I/O PARAMETERS E CONFIRM	Too many parameters in the I/O related command.		

Error code	Error Display	Cause	Verification item	Solution
E03015	E03015 HP-GL ERROR 15 ERROR IN I/O TRANSMISSION E CONFIRM	Framing error, parity error, or overrun error has occurred.		Set the RS-232C transmission condition.
E03016	E03016 HP-GL ERROR 16 I/O BUFFER OVERFLOW E CONFIRM	Interface buffer memory has overflowed.		Set the RS-232C transmission condition.

8.4.4 Error Messages on ARMS

Error code	Error Display	Cause	Solution
E04001	E04001 ARMS AXIS SET ERROR! SET AGAIN	Tilt to adjust with AXIS ALIGNMENT is too large.	Reload the media.
E04002	E04002 ARMS ADJUSTMENT ERROR DISTANCE SET AGAIN	It is over the setting range of the distance adjust.	Set to smaller value.
E04003	E04003 ARMS IT IS NOT POSSIBLE TO ADJUST IT.	Failed to adjust the sensor level.	This media cannot be used. Use other media possible to detect the registration mark.
E04004	E04004 ARMS DISTANCE ADJUSTMENT ERROR SET AGAIN	It is over the setting range of the distance adjust.	Set to smaller value.
E04005	E04005 ARMS MARK SCAN ERROR!	Could not scan the registration marks.	Check the registration mark scanning position.
E04006	E04006 ARMS BUFFER OVERFLOW	Amount of data has exceeded the I/O buffer size for the segment area registration mark.	Decrease the data.
E04007	E04007 ARMS ILLEGAL PLOT AREA	Test pattern plotting position is not within the plotting area for sensor position adjustment.	Move the media toward center and plot the test pattern.
E04008	E04008 ARMS MARK SCAN ERROR! MEDIA END DURING MEDIA DETECTION	Media end was detected while detecting the registration mark.	Check the media. Check the print position of the registration mark.
E04009	E04009 ARMS MARK SCAN ERROR! NOT ENOUGH LENGTH IN +X DIRECTION	It has exceeded detection area while detecting the registration mark.	Check the media. Check the print position of the registration mark.
E04010	E04010 ARMS MARK SCAN ERROR! EXCEED CUTTING AREA DURING +X DETECTION	It has exceeded detection area while detecting the registration mark.	Check the media. Check the print position of the registration mark.
E04011	E04011 ARMS MARK SCAN ERROR! NOT ENOUGH LENGTH IN -X DIRECTION	It has exceeded detection area while detecting the registration mark.	Check the media. Check the print position of the registration mark.
E04012	E04012 ARMS MARK SCAN ERROR! EXCEED CUTTING AREA DURING -X DETECTION	It has exceeded detection area while detecting the registration mark.	Check the media. Check the print position of the registration mark.

Error code	Error Display	Cause	Solution
E04013	E04013 ARMS MARK SCAN ERROR! NOT ENOUGH LENGTH IN +Y DIRECTION	It has exceeded detection area while detecting the registration mark.	Check the media. Check the print position of the registration mark.
E04014	E04014 ARMS MARK SCAN ERROR! EXCEED CUTTING AREA DURING +Y DETECTION	It has exceeded detection area while detecting the registration mark.	Check the media. Check the print position of the registration mark.
E04015	E04015 ARMS MARK SCAN ERROR! NOT ENOUGH LENGTH IN -Y DIRECTION	It has exceeded detection area while detecting the registration mark.	Check the media. Check the print position of the registration mark.
E04016	E04016 ARMS MARK SCAN ERROR! EXCEED CUTTING AREA DURING -Y DETECTION	It has exceeded detection area while detecting the registration mark.	Check the media. Check the print position of the registration mark.
E04017	E04017 ARMS MARK SCAN ERROR! MOVING DESTINATION IS OUT OF AREA	It has exceeded detection area while detecting the registration mark.	Check the media. Check the print position of the registration mark.
E04018	E04018 ARMS MARK SCAN ERROR! MEDIA SET LEVER IS LOWERD JOB IS CANCELD	Media set lever was lowered.	Reload the media and try again.
E04019	E04019 ARMS CANCEL IS SELECTED AT MOVE DISTANCE	There was cancel operation by the user.	
E04020	E04020 ARMS MARK SCAN ERROR! DETECTION ERROR JOB IS CANCELED	There is a defect in the detection settings value.	Check the settings value.
E04021	E04021 ARMS MARK SCAN ERROR! MARK IS NOT FOUND IN EFFECTIVE AREA	Registration mark was not detected in the auto detection area.	Check the media. Check the print position of the registration mark.
E04022	E04022 ARMS JOB IS CANCELED	There was cancel operation by the user.	
E04023	E04023 ARMS MARK SCAN ERROR! MARK WAS NOT FOUND	Registration mark was not detected.	Readjust the sensor level. Change the color of the registration mark. Check the media. Check the print position of the registration mark.

Error code	Error Display	Cause	Solution
E04024	E04024 ARMS MARK SCAN ERROR! MARK SENSOR LEVEL WAS NOT ENOUGH	Registration mark was not detected.	Readjust the sensor level. Change the color of the registration mark. Check the media. Check the print position of the registration mark.
E04025	E04025 ARMS MARK SCAN ERROR! MARK WAS NOT FOUND IN HIGH SPEED MODE	Registration mark was not detected.	Readjust the sensor level. Change the color of the registration mark. Check the media. Check the print position of the registration mark.

8.4.5 Other Error Messages

Error code	Error Display	Cause	Verification item	Solution
E05001	E05001 ERROR COPY MODE BUFFER FULL! E CONFIRM	Data larger than the buffer size cannot be copied.		Perform normal cutting not using
E05002	E05002 ERROR NO DATA FOR COPY IN BUFFER! E CONFIRM	There is no data to copy.		Perform normal cutting by sending the data, then use the copy mode.
E05003	E05003 ERROR CANNOT COPY CUT AREA TOO SMALL! E CONFIRM	Media valid area to copy is too small.	Check the madia size.	Use larger media.
E05004	E05004 ERROR REALIGN ROLLERS E CONFIRM	The push roller is not on the grit roller.	Check the push roller position.	Set the push roller on the grit roller.
E05005	E05005 ERROR CROSS CUT ERROR E CONFIRM	It has failed to cross cut. The media was not cut off.	Check the blade for the cross cut. Check the media on the writing panel.	Replace the cross cutter blade, if the cross cutter blade is defective.
E05006	E05006 ERROR ILLEGAL PLOT AREA E CONFIRM	Distance between the bottom left and top right of the AREA setting is less than 5 mm.		Perform the AREA setting again.
E05007	E05007 ERROR ILLEGAL PLOT AREA E CONFIRM	Test pattern for the TOOL OFFSET ADJ. cannot start plotting because the start position is at the edge of the media.		Set the start position inside the media.

8.4.6 Warning Messages

Error code	Error Display	Cause	Solution
W06001	W06001 WARNING CROSS CUT SHEET	Cross cut function cannot be used for sheet media.	Use roll media.
W06002	W06002 WARNING CROSS CUT FRONT E CONFIRM	Cross cut function cannot be used because the media is loaded from the front.	Load the media from the rear.
W06003	W06003 WARNING CROSS CUT LOAD MEDIA	Cross cut function cannot be used until the media size is detected.	Load the media.
W06004	W06004 WARNING CROSS CUT PUSH ROLLER SENSOR DISABLED	Cross cut function cannot be used when the push roller sensor is disabled.	Enable the push roller sensor.
W06005	W06005 WARNING CROSS CUT MEDIA SENSOR DISABLED	Cross cut function cannot be used when the media sensor is disabled.	Enable the media sensor.
W06006	W06006 WARNING TOOL=POUNCE	CONDITION No. that has selected pouncing tool as the tool number setting can only set TOOL 1.	Select TOOL 1.

8.5 Service mode

8.5.1 Sensor Test Mode & Panel Switch Test Mode

This mode checks the sensor status and the control panel switch status. If there is a bad sensor you will observe one of the symptoms in the table below.

Please check the relevant sensor(s).

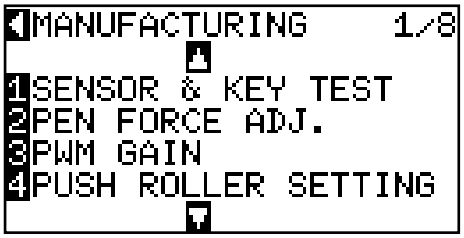
Sensor	Symptom
Y home sensor	The pen block hits the right side plate.
Cam sensor	The plotter displays “LOAD MEDIA!” when media is already loaded.
Pinch roller sensor	The pen block hits the left side plate.
+X, -X media sensor	Media drops out of the plotter.

How to test the sensors

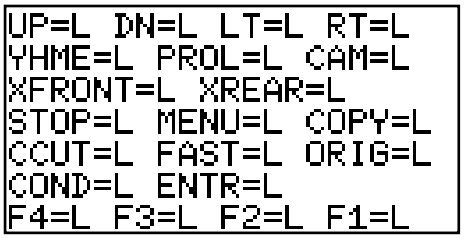
(1) Load an A2 or larger size sheet of paper in the plotter.

(2) Enter the adjustment menu (see Section 7.3.4).

(3) Press the MENU key to display the menu shown below.



(5) Press the F1 key to display the menu shown below.



Each short forms are corresponding to the sensors and the control panel switches as shown below.

Short form	Sensor or key	Short form	Sensor or key	Short form	Sensor or key	Short form	Sensor or key
UP	Up arrow key	DN	Down arrow key	LT	Left arrow key	RT	Right arrow key
YHME	Y home sensor	PROL	Pinch roller sensor	CAM	Cam sensor		
XFRONT	Front media sensor	XREAR	Rear media sensor				
STOP	STOP key	MENU	Menu key	COPY	Copy key		
CCUT	Cross Cut key	FAST	Fast key	ORIG	Origin key		
COND	Condition key	ENTR	Enter key				
F4	4 key	F3	3 key	F2	2 key	F1	1 key

(6) Cover the front media sensor with a piece of paper.
The status of XFRONT changes from “L” to “H”.

(7) Cover the rear media sensor with a piece of paper.
The status of XREAR changes from “L” to “H”.

(8) Move the pen block to the far right. When the pen block reaches the home position flag, the status of YHME changes from “L” to “H”.

(9) Lower the media set lever to raise the pinch rollers. The status of CAM changes from “L” to “H”.

(10) Move the pen block to the left and right. When the pen block crosses the pinch roller, the status of PROL changes from “L” to “H”.

(11) Press each key on the control panel; the status will change from “L” to “H”.

(12) When testing is completed, turn off the power to the plotter.

8.5.2 Printing the Setting of the Plotter

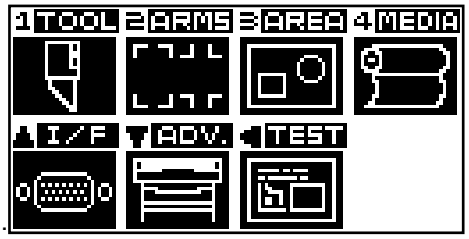
Condition setting list can be printed when you need to check the current setting of the plotter.

Operation

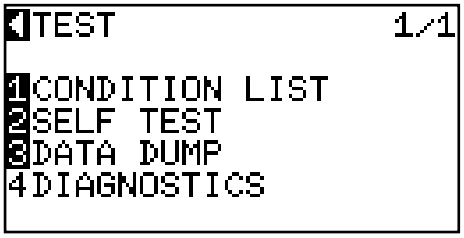
(1) Set a paper larger than A3 size.

(2) Set the pen tool to the tool carriage and select the condition where the pen tool is set.

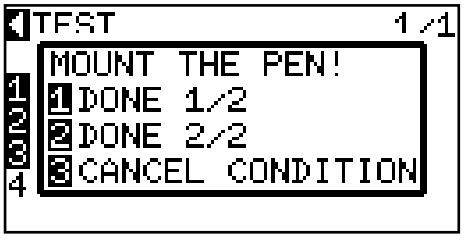
(3) Press the [MENU] key to display the menu below



(4) Press the POSITION (◀) key (TEST) to display the menu below.



(5) Press the [1] key (CONDITION LIST) to display the menu below.



(6) Press the [1] key (DONE 1/2) or the [2] key (DONE 2/2).

Message to confirm tool position is displayed.

(7) Move the tool carriage to print start position by using the POSITION key.

(8) Press the ENTER key to start printing the condition list.

It will return to READY status when the printing is completed.

8.5.3 Printing the Test Pattern

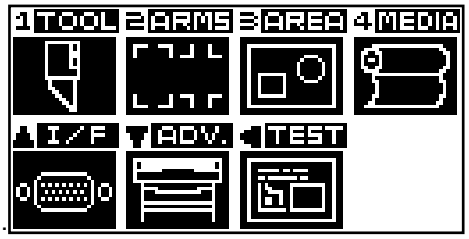
Print a self-test pattern to check the operation of the plotter.

Operation

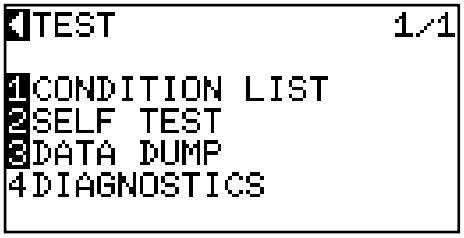
(1) Set a paper larger than A3 size.

(2) Set the pen tool to the tool carriage and select the condition where the pen tool is set.

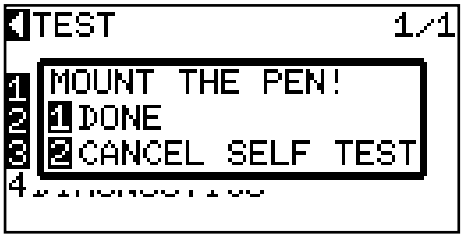
(3) Press the [MENU] key to display the menu below



(4) Press the POSITION (◀) key (TEST) to display the menu below.



(5) Press the [2] key (SELF TEST) to display the menu below.



(6) Confirm that the pen tool is set.

(7) Press the [1] key (DONE) to print the test pattern.

(8) Turn the power off to stop the printing.

8.5.4 Confirm the Cutting Data

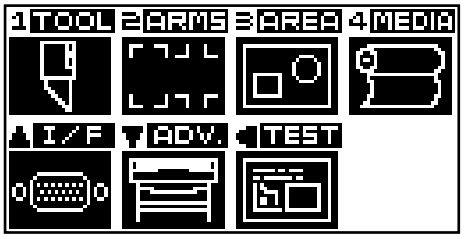
Output of the dump list of the cutting data received by the plotter is possible. It is used to check if the transmission of cutting data is performed correctly.

Operation

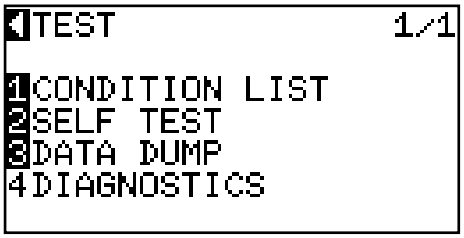
(1) Set a media larger than A4 size.

(2) Set the pen tool to the tool carriage and select the condition where the pen tool is set.

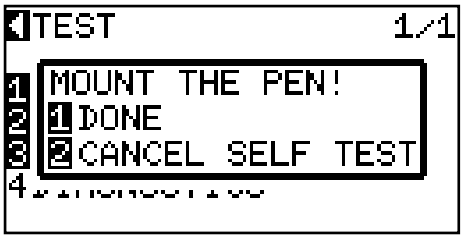
(3) Press the [MENU] key to display the menu below.



(4) Press the POSITION (◀) key (TEST) to display the menu below.



(5) Press the [3] key (DATA DUMP) to display the menu below.



(6) Confirm that the pen tool is set.

(7) Press the [1] key (DONE) to print the test pattern.

(8) Turn the power off to stop the printing.

8.5.5 Self Diagnostic Test

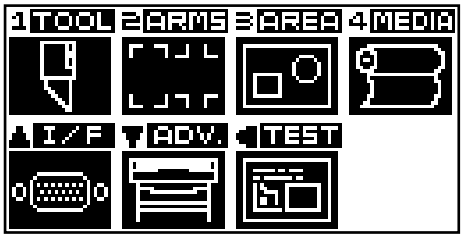
Operation status can be tested by self diagnostic test by operating the sensors and switches following the instruction on the screen.

Operation

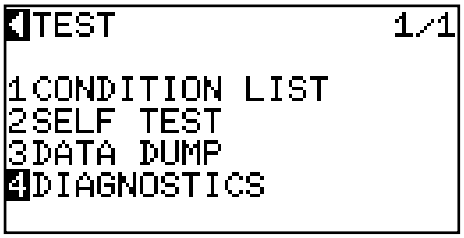
(1) Confirm that the power is turned off.

(2) Turn the power on without loading the media.

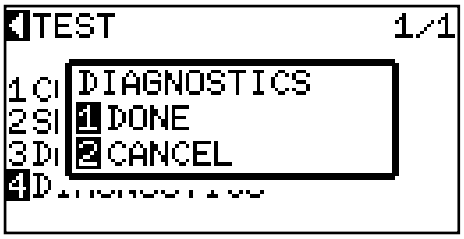
(3) Press the [MENU] key to display the menu below.



(4) Press the POSITION (◀) key (TEST) to display the menu below.

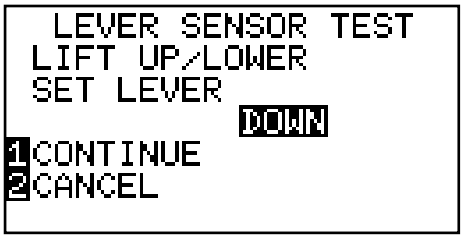


(5) Press the [4] key (DIAGNOSTICS) to display the menu below.



(6) Press the [1] key (DONE).

The first testing menu is displayed. And follow the instructions on the menu.



(7) Press the [1] key to continue to the next test, after you check the CAM lever sensor.

(8) The testing items are shown below.

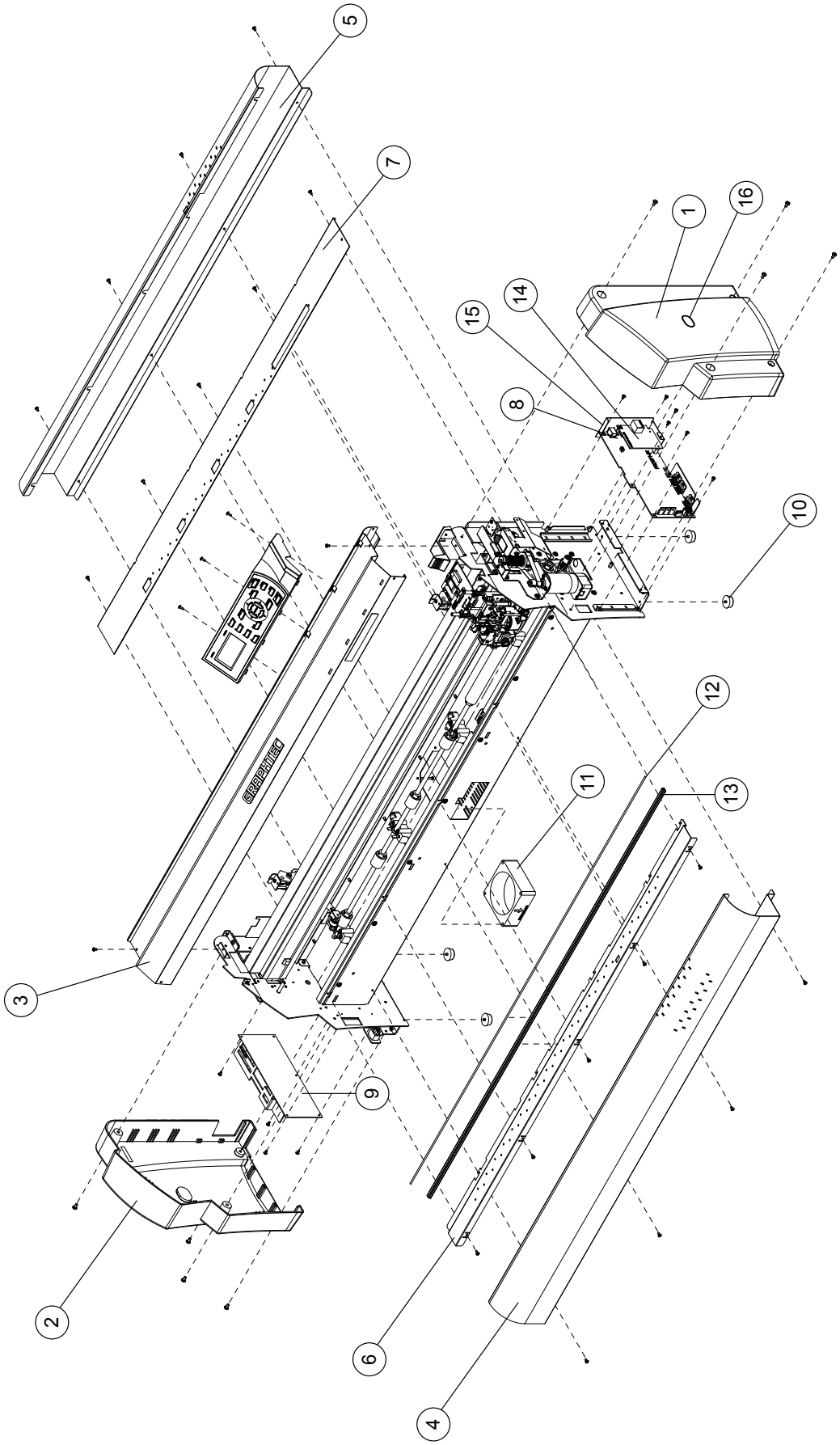
1	Cam lever sensor	2	Home sensor	3	Push roller sensor	4	Rear media sensor
5	Font media sensor	6	X motor signal	7	Y motor signal	8	Tool height signal
9	[1] key	10	[2] key	11	[3] key	12	[4] key
13	POSITION [▶] key	14	POSITION [◀] key	15	POSITION [▼] key	16	POSITION [▲] key
17	[ENTER] key	18	[CONDITION] key	19	[ORIGIN] key	20	[FAST] key
21	[CROSS CUT] key	22	[COPY] key	23	[MENU] key	24	[STOP] key

9. PARTS LIST

9.1 Outer Casing

No.	Part No.	Description	Q'ty	Remarks	Rank
1	621404011	Right Side Cover	1		C
	621524010	Right Side Cover 89	1	89 series	C
2	621404001	Left Side Cover	1		C
	621524000	Left Side Cover 89	1	89 series	C
3	621404111	Center Cover 60	1	FC8000-60	C
	621414212	Center Cover 75	1	FC8000-75/	C
	621424212	Center Cover 100	1	FC8000-100	C
	621434211	Center Cover 130	1	FC8000-130	C
	621444211	Center Cover 160	1	FC8000-160	C
	621524200	Center Cover 8924	1	8924	C
	621534200	Center Cover 8930	1	8930	C
	621544200	Center Cover 8942	1	8942	C
	621554200	Center Cover 8954	1	8954	C
	621564200	Center Cover 8964	1	8964	C
	363013061	Rubber Stopper	1		C
4	621390081	Front Guide 60	1	FC8000-60	C
	621261085	Front Guide 75	1	FC8000-75	C
	621271086	Front Guide 100	1	FC8000-100	C
	621281086	Front Guide 130	1	FC8000-130	C
	621291086	Front Guide 160	1	FC8000-160	C
5	621390091	Rear Guide 60	1	FC8000-60	C
	621261096	Rear Guide 75	1	FC8000-75	C
	621271096	Rear Guide 100	1	FC8000-100	C
	621281096	Rear Guide 130	1	FC8000-130	C
	621291096	Rear Guide 160	1	FC8000-160	C
6	621400101	Front Writing Panel 60	1	FC8000-60	C
	621410101	Front Writing Panel 75	1	FC8000-75	C
	621420101	Front Writing Panel 100	1	FC8000-100	C
	621430101	Front Writing Panel 130	1	FC8000-130	C
	621440101	Front Writing Panel 160	1	FC8000-160	C
7	621390041	Rear Writing Panel 60	1	FC8000-60	C
	621261044	Rear Writing Panel 75	1	FC8000-75	C
	621271044	Rear Writing Panel 100	1	FC8000-100	C
	621281044	Rear Writing Panel 130	1	FC8000-130	C
	621291045	Rear Writing Panel 160	1	FC8000-160	C
8	792800700	Main Board for FC8000	1	FC8000	A
	792800770	Main Board for 89 series	1	8924/8930/8942/8954/8964	C
9	500052449	Power Supply Board (PS3122)	1		C
10	363024101	Foot (NT24)	4		C
11	500052449	Fan (TDS-05B-DC12V)	1		B
12	621390470	Cutting Mat 60	1	FC8000-60, 8924	A
	621261470	Cutting Mat 75	1	FC8000-75, 8930	A
	621271073	Cutting Mat 100	1	FC8000-100, 8942	A
	621281073	Cutting Mat 130	1	FC8000-130, 8954	A
	621291073	Cutting Mat 160	1	FC8000-160, 8964	A
13	621390060	Base, Cutting Mat 60	1	FC8000-60, 8924	C
	621261060	Base, Cutting Mat 75	1	FC8000-75, 8930	C
	621271060	Base, Cutting Mat 100	1	FC8000-100, 8942	C
	621281060	Base, Cutting Mat 130	1	FC8000-130, 8954	C
	621291060	Base, Cutting Mat 160	1	FC8000-160, 8964	C
14	792800707	LAN Board	1	Option	B
15	621260152	I/F Panel, STD	1	With Main Board	B
	621401710	I/F Panel, LAN	1	With LAN Board Option	B
16	621404021	Cap, Cover	2		C
	621524020	Cap, Cover 89	2	89 series	C

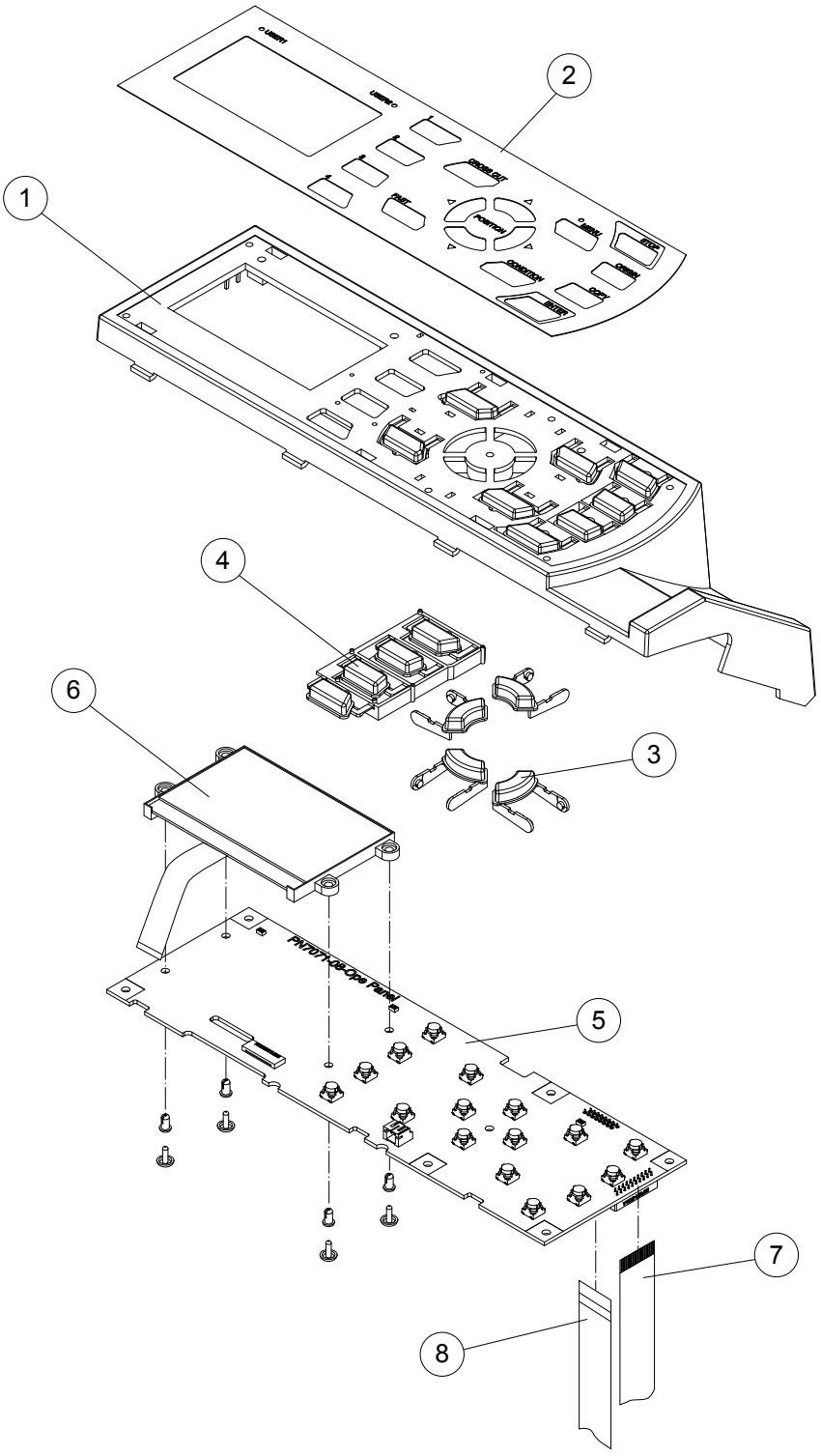
Outer Casing



9.2 Control Panel

No.	Part No.	Description	Q'ty	Remarks	Rank
1	621400091	Cover, Control Panel	1		C
	621524900	Cover, Control Panel, 89	1	89 series	C
2	621400062	Control Panel Sheet	1		C
3	621400081	Key Top, Cursor	1		C
4	621400071	Key Top, Function	4		C
5	792800706	Control Panel Board	1		A
6	682140130	LCD, JMS12864-15ABAYD	1		A
7	692140320	Flexible Cable, FPC707102	1	20P, J801 to J3	B
8	692140370	Flexible Cable, FPC707107	1	16P, J802 to J22 (LCD Cont.)	B

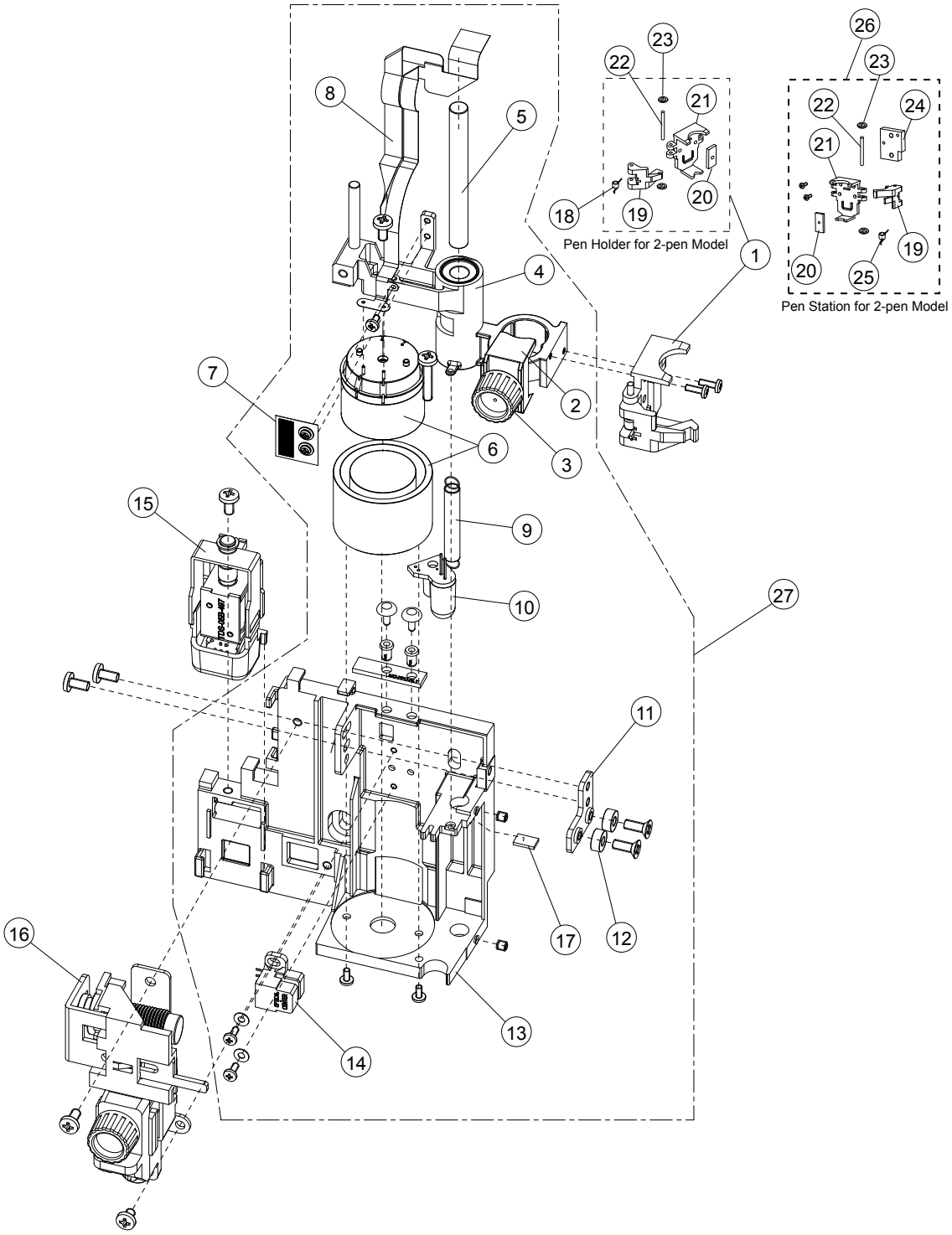
Control Panel



9.3 Pen Block

No.	Part No.	Description	Q'ty	Remarks	Rank
1	792219702	Pen Holder Assy 4200	1	For 2-pen model	A
2	621403030	Cutter Pen Holder	1		C
3	621353010	Thumb Screw L10	1		B
4	621403000	Pen Arm	1		C
5	621263230	Slide Shaft	1		C
6	682126520	Moving Coil with Yoke (PM1306)	1		C
7	617363351	Pen Encoder Strip	1		C
8	692140400	Pen Flexible Cable, FPC7071110	1		C
9	380205511	Pen Arm Spring E-551	1		C
10	792800708	Light Pointer Assy	1		A
11	621263251	Bearing Roller Base Bracket	1		C
12	310068320	Bearing Roller	2	683ZZMC3PS2S	C
13	621403010	Moving Coil Base	1		C
14	500050122	Encoder Sensor, HEDS-9720#P50	1		C
15	-	Registration Mark Sensor Assy	1	See Registration Mark Sensor Assy Part	-
16	792800711	Cross Cutter Assy	1		B
17	621113520	Rubber plate	1		C
18	622192091	Arm Spring 2	1	For 2-pen model	C
19	622192070	Lock Arm	2	For 2-pen model	C
20	053203420	Magnet	2	For 2-pen model	C
21	622192060	Pen Holder AP	2	For 2-pen model	C
22	337120250	Shaft Pin D2L25H7	2	For 2-pen model	C
23	333302001	Stopper Ring CS 2 mm	4	For 2-pen model	C
24	621163200	Pen Holder Spacer	1	For 2-pen model	C
25	622192081	Arm Spring 1	1	For 2-pen model	C
26	792219703	Pen Station Assy 4200	1	For 2-pen model	B
27	792800708	Pen Block Assy			A

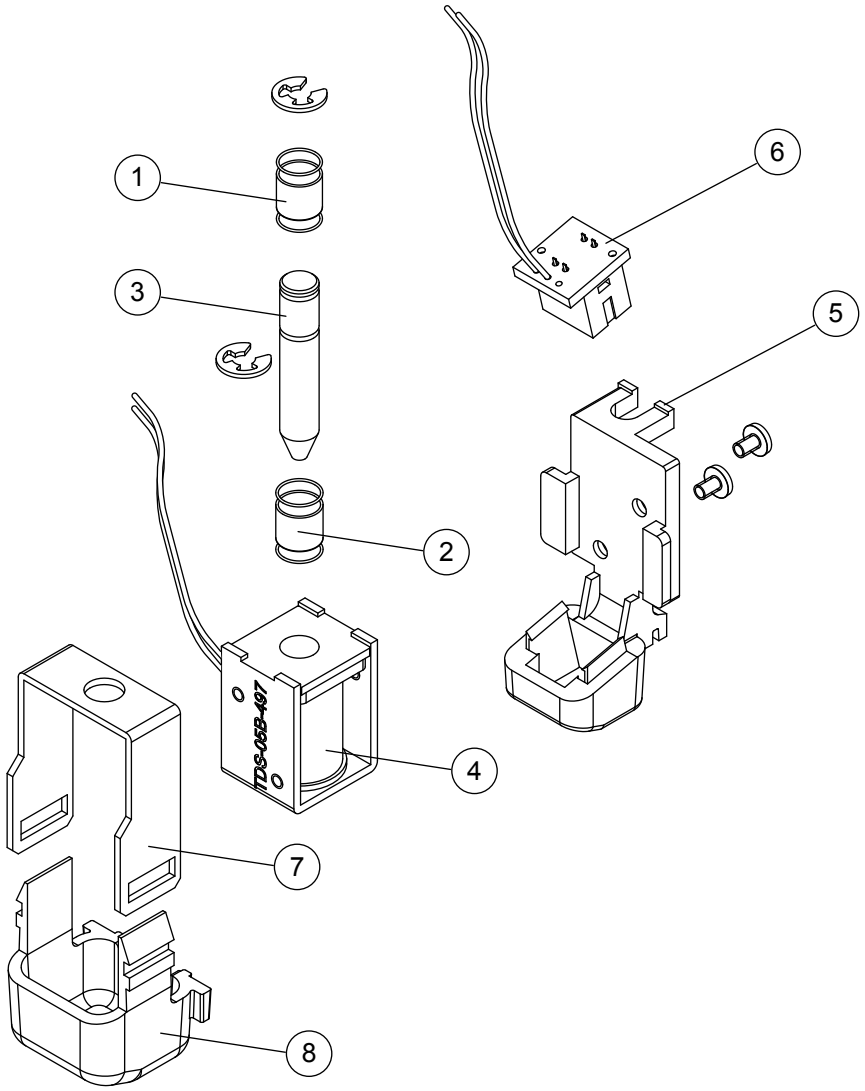
Pen Block



9.4 Registration Mark Sensor Assy

No.	Part No.	Description	Q'ty	Remarks	Rank
1	621403200	Spring, Cover Down	1		C
2	621263340	Spring, RMS Up	1		C
3	500052472	Core, Solenoide	1		B
4		Solenoide	1		
5	621263312	Bracket, RMS sensor	1		C
6	792800704	Registration Mark Sensor Board	1		A
7	621263322	Paper Hold Down A	1		C
8	621263331	Paper Hold Down B	1		C

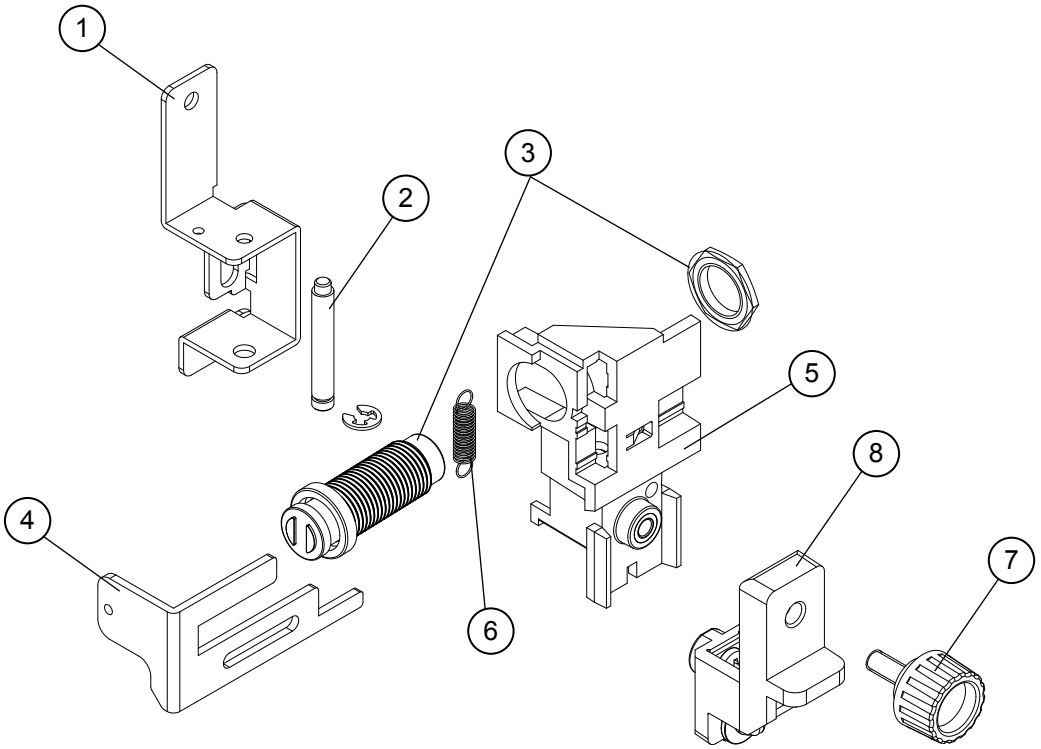
Registration Mark Sensor Assy



9.5 Cross Cutter

No.	Part No.	Description	Q'ty	Remarks	Rank
1	621403110	Bracket, Cross Cutter	1		C
2	621263453	Shaft, Cross Cutter	1		C
3	621263460	Latch, TL-294	1		B
4	621403120	Arm, Catch	1		C
5	621403100	Cross Cutter Base	1		C
6	380265331	Spring, E-533	1		C
7	621113591	Thumb Screw, L10	1		B
8	CT01H	Cross Cutter Blade, Standard Type	1	Consumption goods	-
	CT02U	Cross Cutter Blade, High durability Type	1	Consumption goods	-

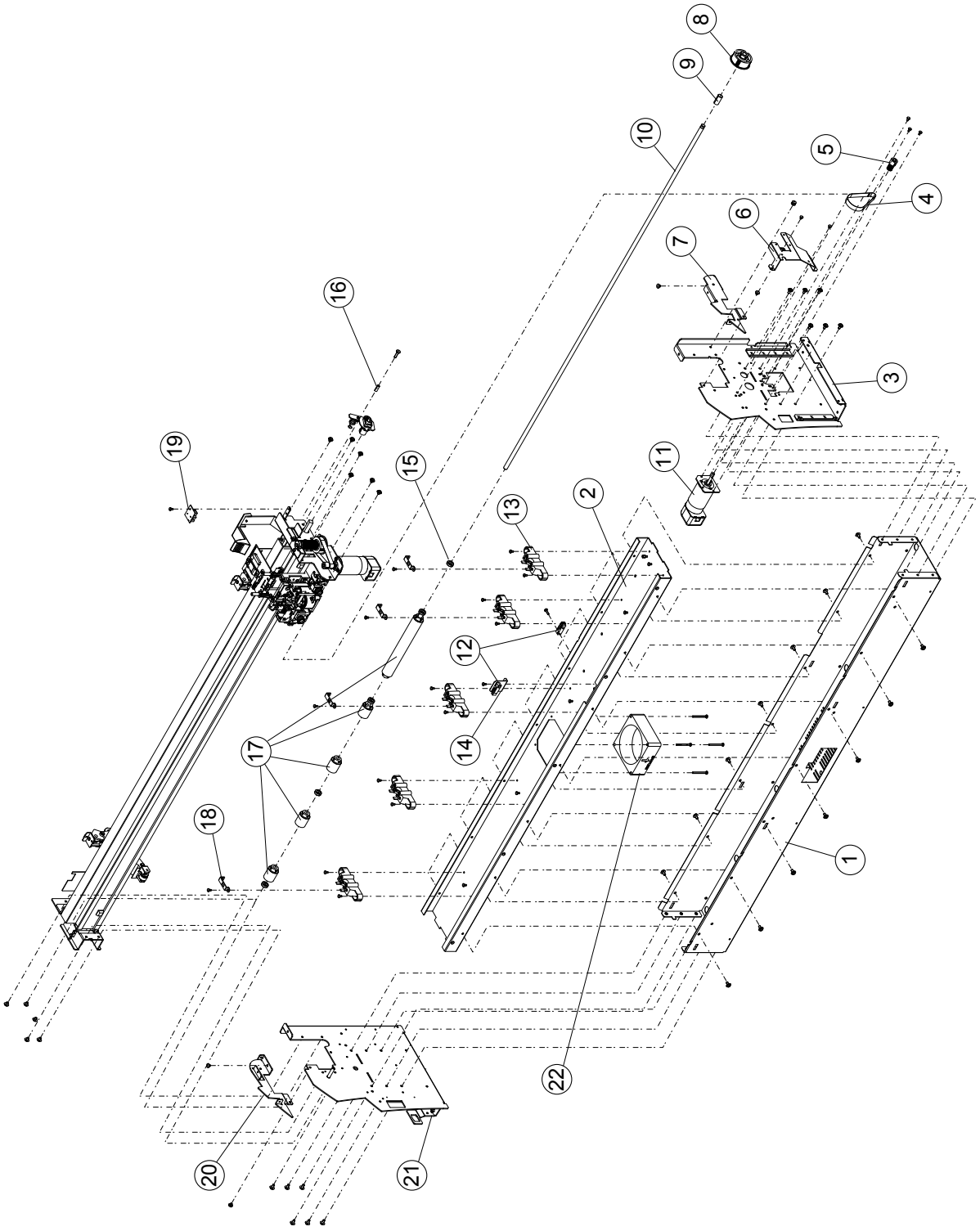
Cross Cutter



9.6 Main Frame

No.	Part No.	Description	Q'ty	Remarks	Rank
1	621390010	Main Chassis 60	1	FC8000-60	C
	621261014	Main Chassis 75	1	FC8000-75	C
	621271014	Main Chassis 100	1	FC8000-100	C
	621281014	Main Chassis 130	1	FC8000-130	C
	621291014	Main Chassis 160	1	FC8000-160	C
2	621390021	Sub Chassis 60	1	FC8000-60	C
	621261024	Sub Chassis 75	1	FC8000-75	C
	621271025	Sub Chassis 100	1	FC8000-100	C
	621281024	Sub Chassis 130	1	FC8000-130	C
	621291024	Sub Chassis 160	1	FC8000-160	C
3	621401052	Right Side Plate	1		C
4	378413041	X Drive Belt, 130TN15-10W	1		A
5	010012022	X Motor Pulley, Z24	1		A
6	621401131	Cable Bracket	1		C
7	621401081	Right Side Sub Plate	1		C
8	621402000	Pulley, X Drive Shaft, TN15-85Z	1		A
9		Bush, D8L21	1		-
10	621392010	X Drive Roller Shaft 60	1	FC8000-60	C
	621262010	X Drive Roller Shaft 75	1	FC8000-75	C
	621272010	X Drive Roller Shaft 100	1	FC8000-100	C
	621282010	X Drive Roller Shaft 130	1	FC8000-130	C
	621292011	X Drive Roller Shaft 160	1	FC8000-160	C
11	682132430	X Motor, UGJMEE-A7JGR34	1	FC8000-100/130/160	A
	682126200	X Motor, DMN37HE-003	1	FC8000-60/75	A
12	500052515	Media Sensor, PS-117ED1	2		A
13	621260011	Pillow Block	5	FC8000-60/FC8000-75	D
	621260011	Pillow Block	7	FC8000-100	D
	621260011	Pillow Block	9	FC8000-130	D
	621260011	Pillow Block	11	FC8000-160	D
14	621260132	Media Sensor Bracket	1		C
15	310014820	Bearing, MR148ZZMC3PS2S	5	FC8000-60/FC8000-75	C
	310014820	Bearing, MR148ZZMC3PS2S	7	FC8000-100	C
	310014820	Bearing, MR148ZZMC3PS2S	9	FC8000-130	C
	310014820	Bearing, MR148ZZMC3PS2S	10	FC8000-160	C
16	392040140	Bush, D4L14	1		C
17	621392020	X Drive Roller Set 60	1	FC8000-60	A
	621262020	X Drive Roller Set 75	1	FC8000-75	A
	621272020	X Drive Roller Set 100	1	FC8000-100	A
	621282020	X Drive Roller Set 130	1	FC8000-130	A
	621292020	X Drive Roller Set 160	1	FC8000-160	A
18	621260021	Bearing Cover	4	FC8000-60/FC8000-75	C
	621260021	Bearing Cover	5	FC8000-100	C
	621260021	Bearing Cover	6	FC8000-130	C
	621260021	Bearing Cover	6	FC8000-160	C
19	792800705	Cam Sensor Board	1		A
20	621401031	Left Side Sub Plate			C
21	621401003	Left Side Plate			C
22	500052451	Fan, KLDC12B4-940	1	FC8000-75/60	A
	500052451	Fan, KLDC12B4-940	2	FC8000-100,130,160	A

Main Frame

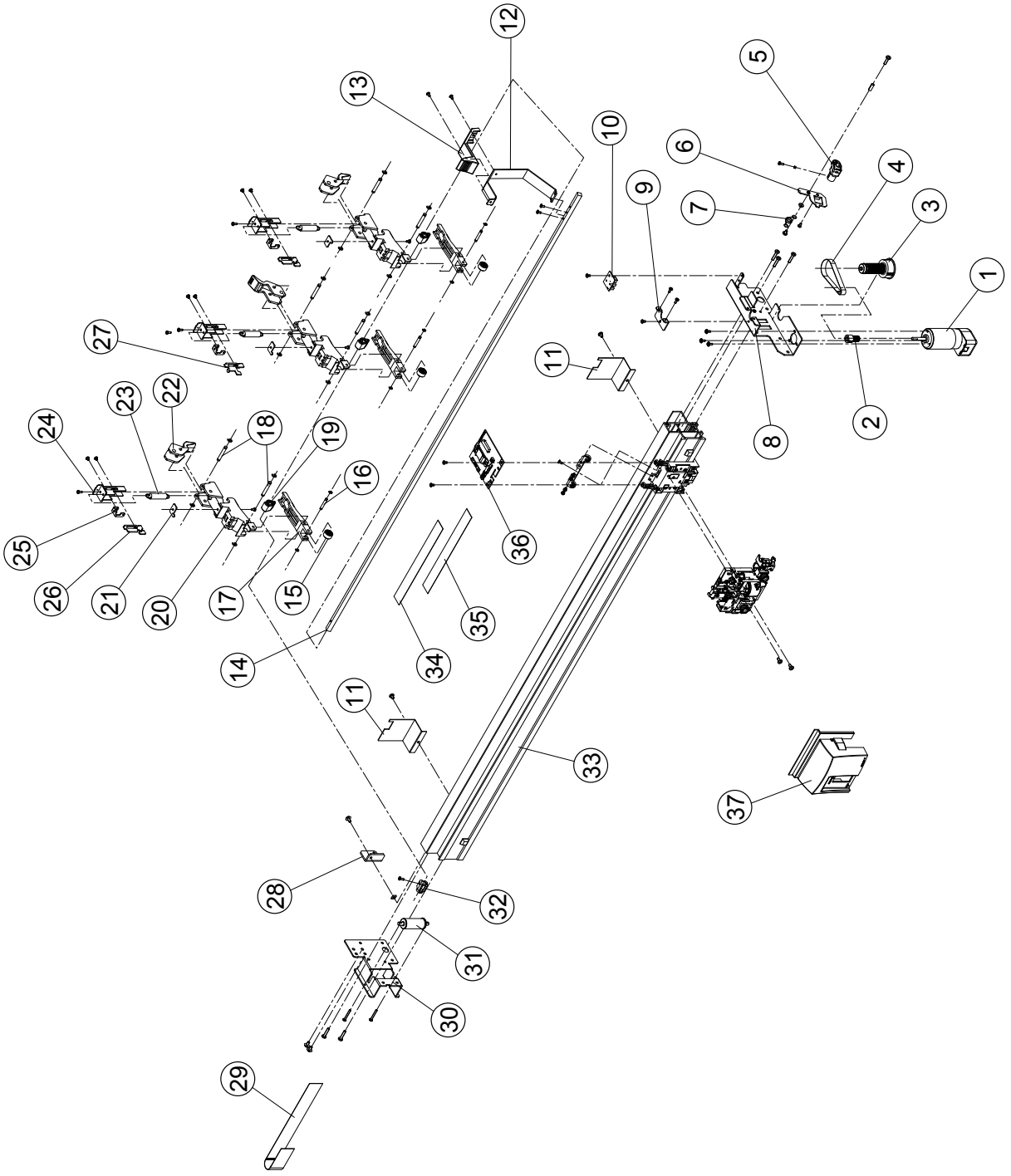


9.7 Y Rail

No.	Part No.	Description	Q'ty	Remarks	Rank
1	682126200	Y Motor, DMN37HE-003	1		A
2	010012022	Y Motor Pulley, Z24	1		B
3	792700705	Y Drive Pulley Assy	1		B
4	378413041	Y Motor Belt, 130TN15-10W	1		B
5	621401100	Cam Shaft Holder Base	1		C
6	621401120	Cam Sensor Dog	1		C
7	621261250	Spring, Lever	1		C
8	621400310	Y Drive Bracket	1		C
9	621263120	Y Drive Adjustment Plate	1		C
10	792800705	Cam Sensor Board	1		A
11	621260202	Y Home Dog	2		C
12	621400390	Cam Lever	1		C
13	621400380	Cam Lever Cap	1		C
14	621400400	Cam Shaft, 60	1	FC8000-60	C
	621410400	Cam Shaft, 75	1	FC8000-75	
	621420400	Cam Shaft, 100	1	FC8000-100	
	621430310	Cam Shaft, 130	1	FC8000-130	
	621440310	Cam Shaft, 160	1	FC8000-160	
15	621352000	Pinch Roller	2	FC8000-60/75	A
			3	FC8000-100/130	
			4	FC8000-160	
16	092002041	Pinch Roller Shaft	2	FC8000-60/75	C
			3	FC8000-100/130	
			4	FC8000-160	
17	621112100	Pinch Roller Arm	2	FC8000-60/75	C
			3	FC8000-100/130	
			4	FC8000-160	
18	621112120	Pinch Roller Arm Shaft	4	FC8000-60/75	C
			6	FC8000-100/130	
			8	FC8000-160	
19	621230111	Cam	2	FC8000-60/75	C
			4	FC8000-100/130	
			3	FC8000-160	
20	621401301	Pinch Roller Base	2	FC8000-60/75	C
			3	FC8000-100/130	
			4	FC8000-160	
21	621263052	Stopper Plate	2		C
22	621401310	Lever, Spring	2	FC8000-60/75	C
			3	FC8000-100/130	
			4	FC8000-160	
23	621401690	Spring, Pinch Roller	2	FC8000-60/75	C
			3	FC8000-100/130	
			4	FC8000-160	
24	621401370	Spring Hook Base Bracket	2	FC8000-60/75	C
			3	FC8000-100/130	
			4	FC8000-160	
25	621401331	Spring Hook	2	FC8000-60/75	C
			3	FC8000-100/130	
			4	FC8000-160	
26	621401351	Spring Hook Stopper, L	2		C
27	621401341	Spring Hook Stopper	1	FC8000-100/130	C
			2	FC8000-160	
28	621400330	Reinforcement Bracket, Y Rail	1		C
29	621391220	Y Belt, 150S2M-1000	1	FC8000-60	A
	621261220	Y Belt, 150S2M-1150	1	FC8000-75	
	621271220	Y Belt, 300S2M-1450	1	FC8000-100	
	621281220	Y Belt, 250S2M-1750	1	FC8000-130	
	621291220	Y Belt, 300S2M-2010	1	FC8000-160	
30	621400320	Idler Bracket	1		C
31	792700702	Idler Pulley Assy	1		B
32	621401110	Cam Shaft Holder	1		C
33	621400300	Y Rail 60	1	FC8000-60	B
	621410300	Y Rail 75	1	FC8000-75	B
	621420300	Y Rail 100	1	FC8000-100	B
	621430300	Y Rail 130	1	FC8000-130	B
	621440300	Y Rail 160	1	FC8000-160	B

No.	Part No.	Description	Q'ty	Remarks	Rank
34	692140330	Y Flexible Cable, FPC707103	1	FC8000-60/75	A
	692140340	Y Flexible Cable, FPC707104	1	FC8000-100	A
	692140350	Y Flexible Cable, FPC707105	1	FC8000-130	A
	692140360	Y Flexible Cable, FPC707106	1	FC8000-160	A
35	621271250	Flexible Cable Reinforcement Bracket 100	1	FC8000-100	C
	621281250	Flexible Cable Reinforcement Bracket 130	1	FC8000-130	C
	621291250	Flexible Cable Reinforcement Bracket 160	1	FC8000-160	C
36	792800702	Pen Relay Board	1		A
37	621263140	Pen Carriage Cover	1		C

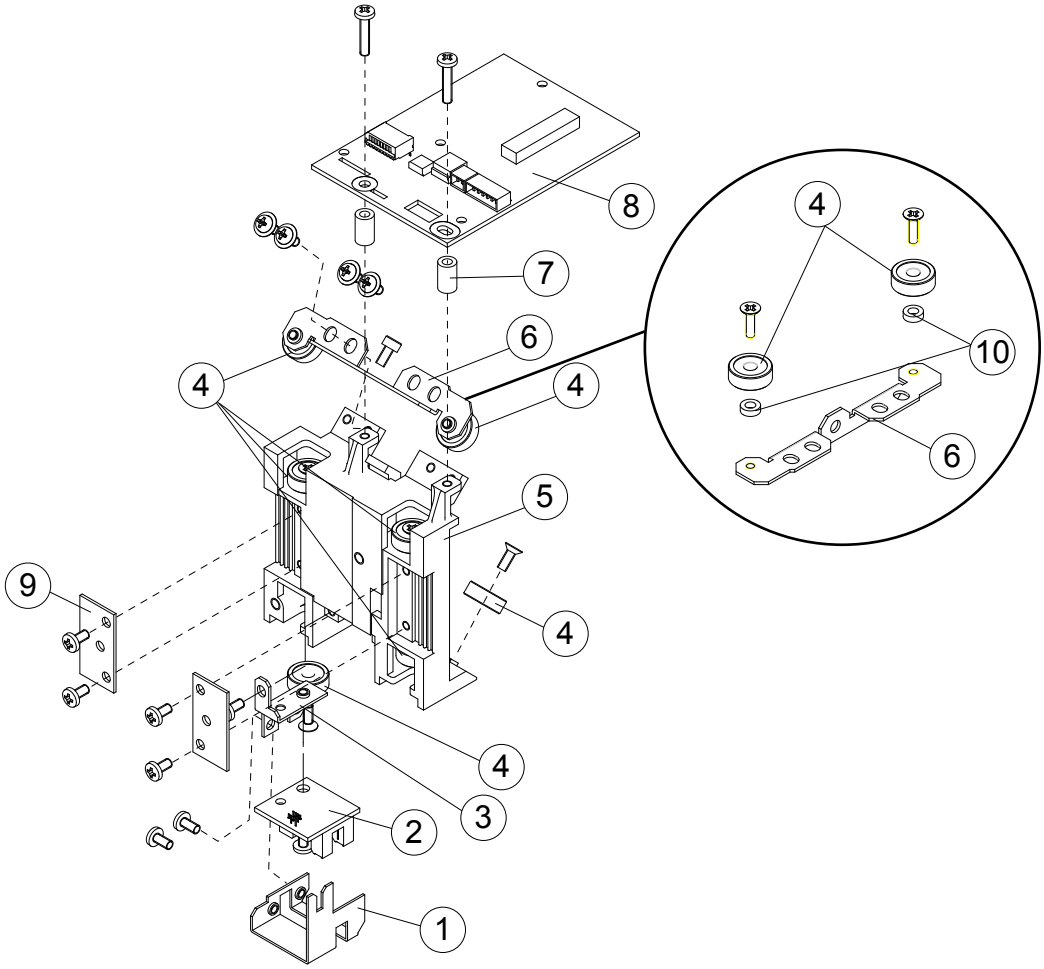
Y Rail



9.8 Y Slider

No.	Part No.	Description	Q'ty	Remarks	Rank
1	621173160	Y Sensor Guard	1		C
2	792800703	Pinch Roller Sensor Board	1		A
3	621173150	Y Sensor Bracket B	1		C
4	095013010	Roller B13	8		C
5	621183403	Y Slider L-FC51	1		C
6	621183410	Roller Tension Plate L	1		C
7	692123350	Spacer CL-310N	2		C
8	792800702	Pen Relay Board	1		C
9	692123320	Y Belt Fixing Plate L-51	2		C
10	392230020	Spacer CE302	2		C

Y Slider



9.9 Wiring Harness

No.	Part No.	Description	Q'ty	Remarks	Rank
1	692140080	Cable, CA707108 (Media Sensor to Main Board)	1		C
2	692140090	Cable, CA707109 (Fan to Main Board)	1	FC8000	C
	692140100	Cable, CA707110 (Fan to Main Board)	1	FC8000-100	C
	692140110	Cable, CA707111 (Fan to Main Board)	1	FC8000-130/160	C
3	692140011	Cable, CA707101A (Power Supply Switch to Main Board)	1	FC8000-60/75	C
	692140021	Cable, CA707102A (Power Supply Switch to Main Board)	1	FC8000-100	C
	692140031	Cable, CA707103A (Power Supply Switch to Main Board)	1	FC8000-130	C
	692140041	Cable, CA707104A (Power Supply Switch to Main Board)	1	FC8000-160	C
4	692140120	Cable, CA707112 (Main Board to Cam Sensor)	1		C
5	692140310	Flexible Cable, FFC707101 (Pinch Roller Sensor)	1		C
6	692140321	Flexible Cable, FFC707102A (Main Board J3 to Control Panel Board J1)	1		B
7	692140371	Flexible Cable, FFC707107A (Main Board J22 to Control Panel Board)	1		B
8	692140181	Cable, CA707118A, X Motor Extension Cable	1	FC8000-100/130/160	C
9	692140240	Cable, CA707124, X Motor Cable	1	FC8000-60/75	C
10	692140250	Cable, CA707125, X Motor Encoder Cable	1	FC8000-60/75	C
11	692140240	Cable, CA707124, Y Motor Cable	1		C
12	692140250	Cable, CA707125, Y Motor Encoder Cable	1		C
13	692140330	Y Flexible Cable, FPC707103	1	FC8000-60/75	A
14	692140340	Y Flexible Cable, FPC707104	1	FC8000-100	A
15	692140350	Y Flexible Cable, FPC707105	1	FC8000-130	A
16	692140360	Y Flexible Cable, FPC707106	1	FC8000-160	A

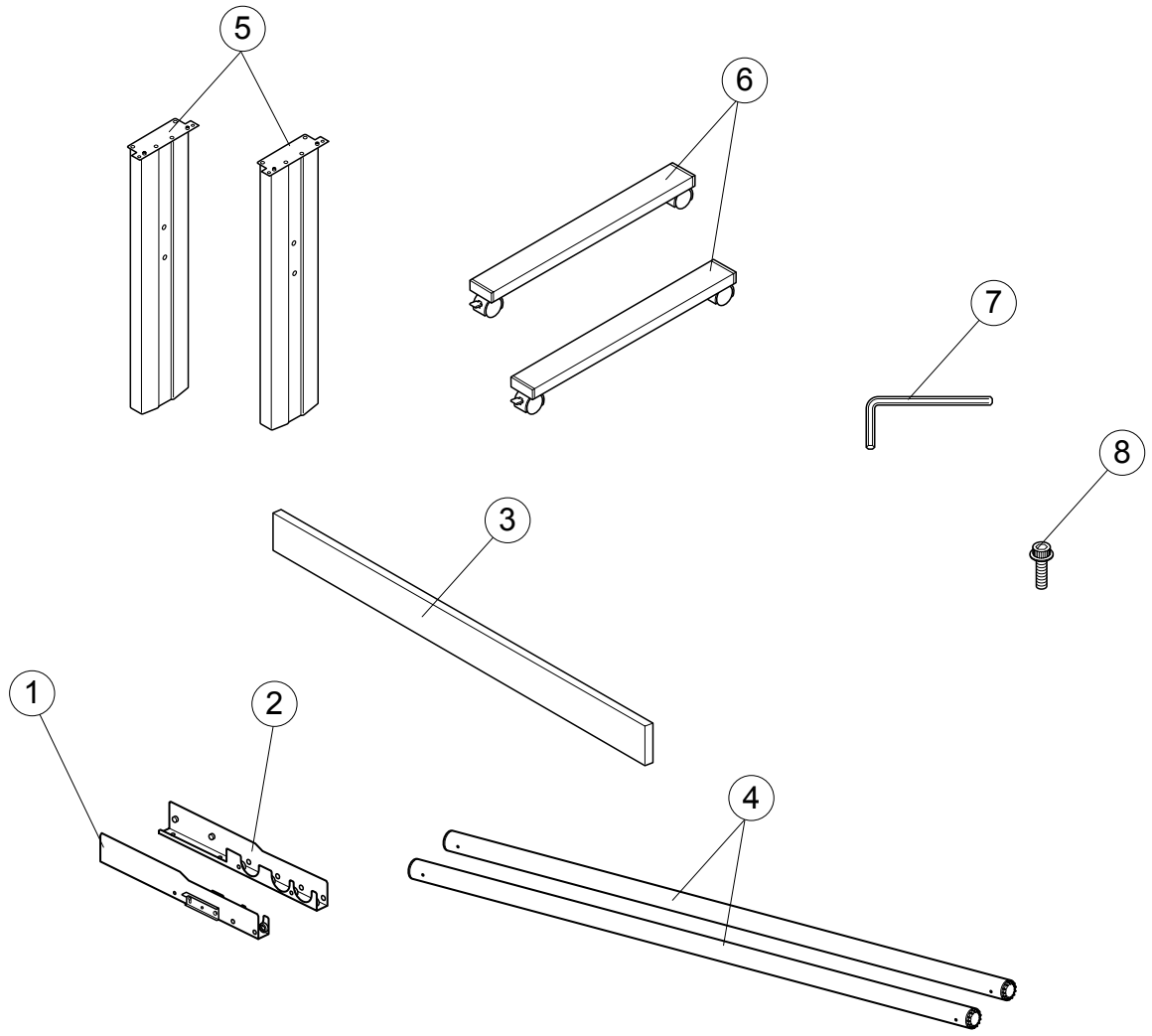
9.10 Labels

No.	Part No.	Description	Q'ty	Remarks	Rank
1	621404590	Emblem FC8000	1	FC8000	C
	621524500	Emblem 8924	1	8924	C
	621534500	Emblem 8930	1	8930	C
	621544500	Emblem 8942	1	8942	C
	621554500	Emblem 8954	1	8954	C
	621564500	Emblem 8964	1	8964	C
2	621264370	Caution Label	1		C
3	621264430	Pinch Roller Pressure Lable	1		C
4	621264380	Caution Label, Cross Cutter	1		C
5	621404510	Model Label 60	1	FC8000-60	C
	621414510	Model Label 75	1	FC8000-75	C
	621424510	Model Label 100	1	FC8000-100	C
	621434510	Model Label 130	1	FC8000-130	C
	621444510	Model Label 160	1	FC8000-160	C
	621524590	Model Label 8924	1	8924	C
	621534590	Model Label 8930	1	8930	C
	621544590	Model Label 8942	1	8942	C
	621554590	Model Label 8954	1	8954	C
	621564590	Model Label 8964	1	8964	C
6	621264390	Standby Label	1		C
7	621264330	I/F Label	1		C
	621404410	I/F Label w/LAN port	1		C
8	621264430	Pinch Roller Pressure Lable	1		C
9	621264410	Push Roller Positioning Label S	8	FC8000-60	C
			6	FC8000-75	C
			12	FC8000-100	C
			16	FC8000-130	C
			20	FC8000-160	C
10	621264420	Push Roller Positioning Label L	2		C

9.11 Media Stocker, Stand

No.	Part No.	Description	Q'ty	Remarks	Rank
1	621269215	Right Media Stocker Bracket	1		C
2	621269225	Left Media Stocker Bracket	1		C
3	621400140	Center Bar 60	1	FC8000-60	C
	621410140	Center Bar 75	1	FC8000-75	C
	621420140	Center Bar 100	1	FC8000-100	C
	621430140	Center Bar 130	1	FC8000-130	C
	621440290	Center Bar 160	1	FC8000-160	C
	621524140	Center Bar 8924	1	8924	C
	621534140	Center Bar 8930	1	8930	C
	621544140	Center Bar 8942	1	8942	C
	621554140	Center Bar 8954	1	8954	C
	621564140	Center Bar 8964	1	8964	C
4	621400150	Stock Roller 60	2	FC8000-60	C
	621410150	Stock Roller 75	2	FC8000-75	C
	621420150	Stock Roller 100	2	FC8000-100	C
	621430150	Stock Roller 130	2	FC8000-130	C
	621440260	Stock Roller 160	2	FC8000-160	C
5	621400902	Side Stay Assembly	2		C
6	621400930	Foot (Base Assembly)	2		C
7		Hexagonal Wrench (M5)	1		-
8		Socket Head Cap Screw	20		-

Media Stocker, Stand



9.10 Basket

No.	Part No.	Description	Q'ty	Remarks	Rank
1	772140920	Basket Assy, PG0039	1	FC8000-60	C
	772141990	Basket Assy, PG0040	1	FC8000-75	C
	772142990	Basket Assy, PG0041	1	FC8000-100	C
	772143990	Basket Assy, PG0042	1	FC8000-130	C
	772144990	Basket Assy, PG0043	1	FC8000-160	C
	772152920	Basket Assy, PG0039 for 8924	1	8924	C
	772153920	Basket Assy, PG0040 for 8930	1	8930	C
	772154920	Basket Assy, PG0041 for 8942	1	8942	C
	772155920	Basket Assy, PG0042 for 8954	1	8954	C
	772156920	Basket Assy, PG0043 for 8964	1	8964	C

9.11 Other Parts

Standard Accessories

No.	Part No.	Description	Q'ty	Remarks	Rank
1	500052533	USB Cable, CBL1112-3.0M	1		C
2	621409910	CD-ROM (FC8000-CDM01M)	1	FC8000	C
	621313413	CD-ROM (VinylEXCDM04M)		89 series	C
3	621520420	Setup Manual 89		89 series	C

Regarding the rank of spare parts

Rank A: This rank of part will be stocked always until product discontinued.

Rank B: This rank of part will not be stocked always. This parts will need a lead time maximumly 3 month.

Rank C: This rank of part will not be stocked always. This parts will need a lead time at least 3 month.

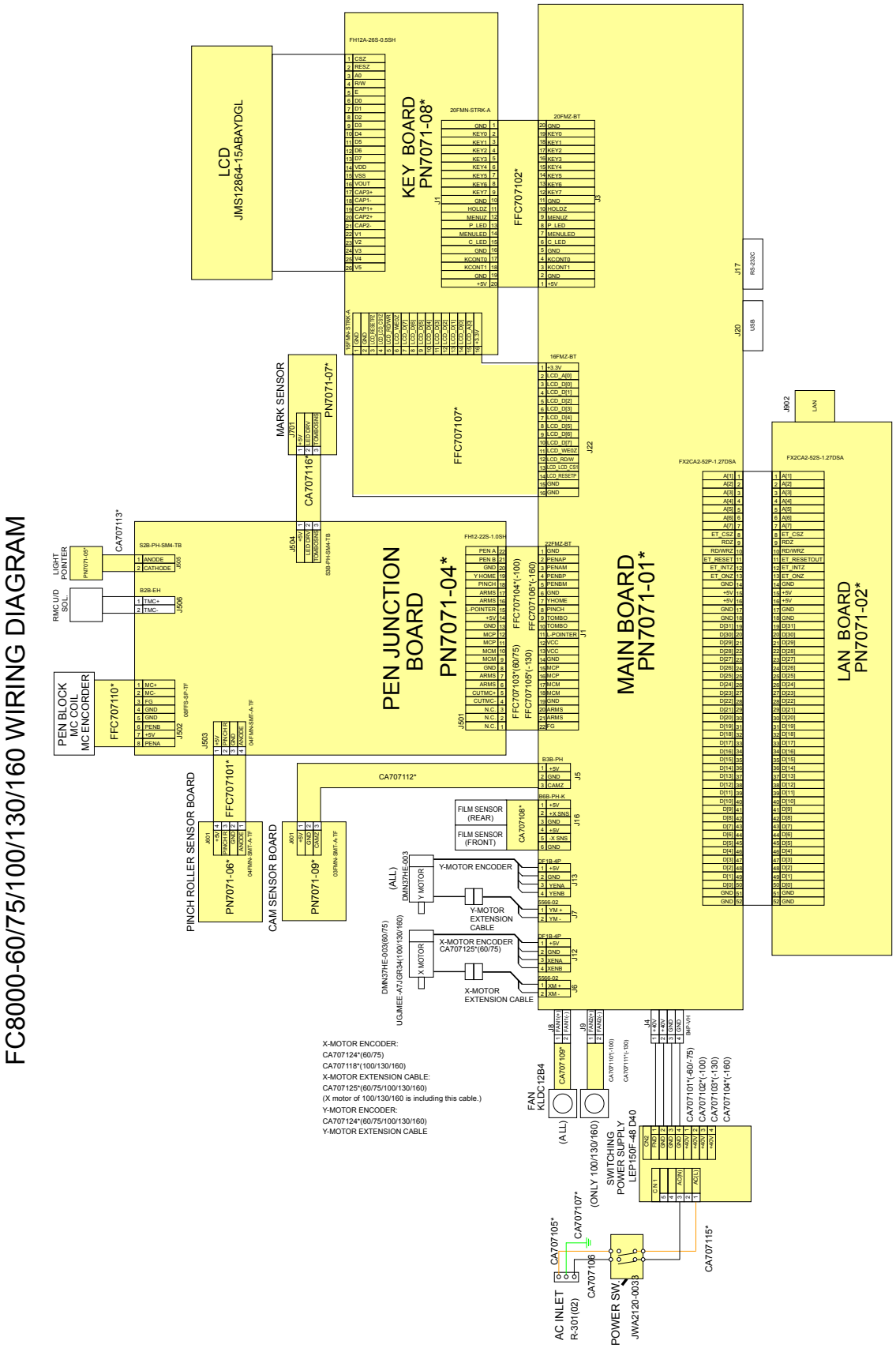
Rank D: This rank of part will not be supplied as spare parts.

The parts will be supplied during five years unless the part run out after discontinued product.

Some of outer parts may not be supplied after production was discontinued.

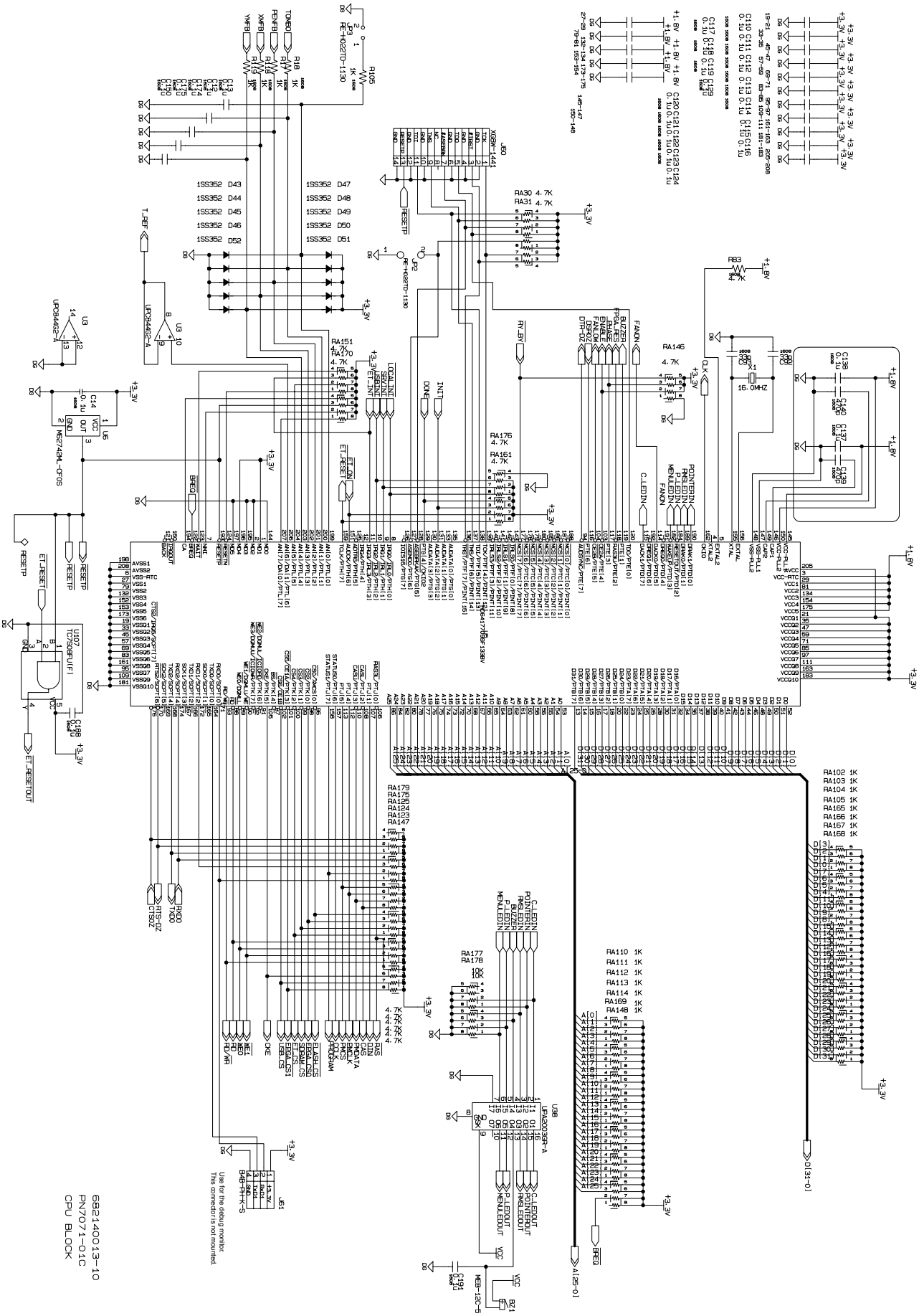
10. BLOCK DIAGRAMS AND CIRCUIT DIAGRAMS

10.1 Block Diagrams

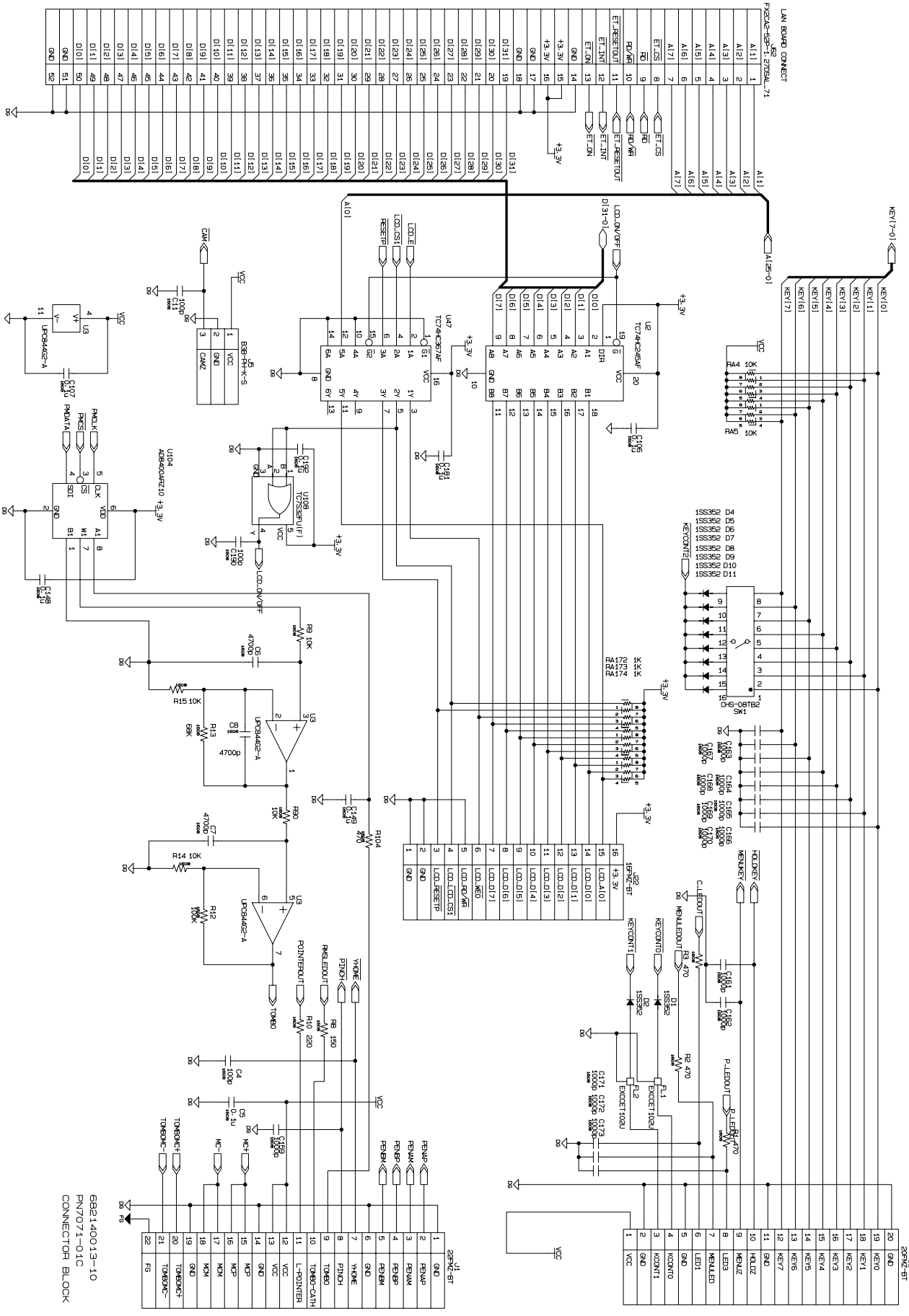


10.2 Circuit Diagrams

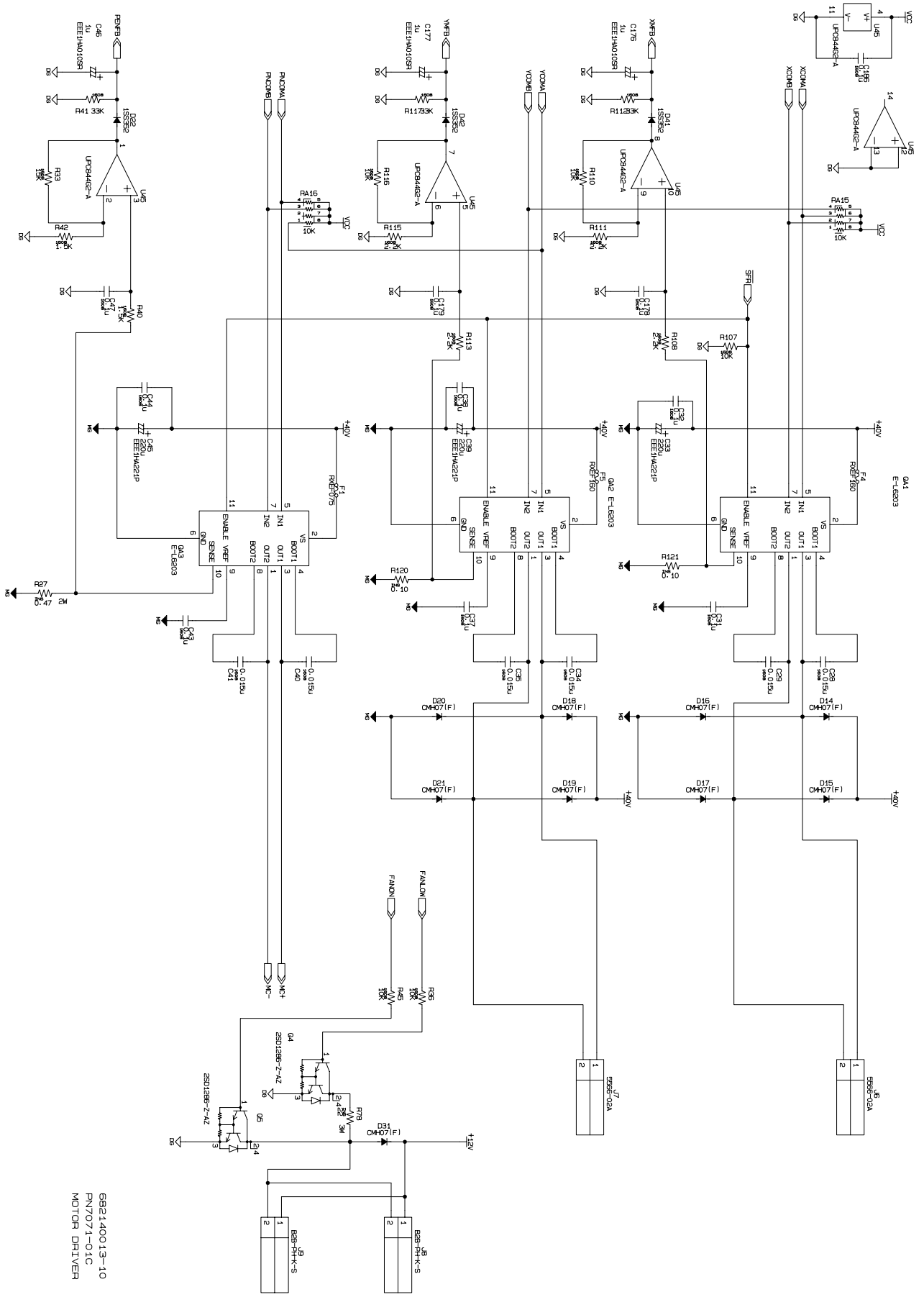
10.2.1 Main Board (CPU)



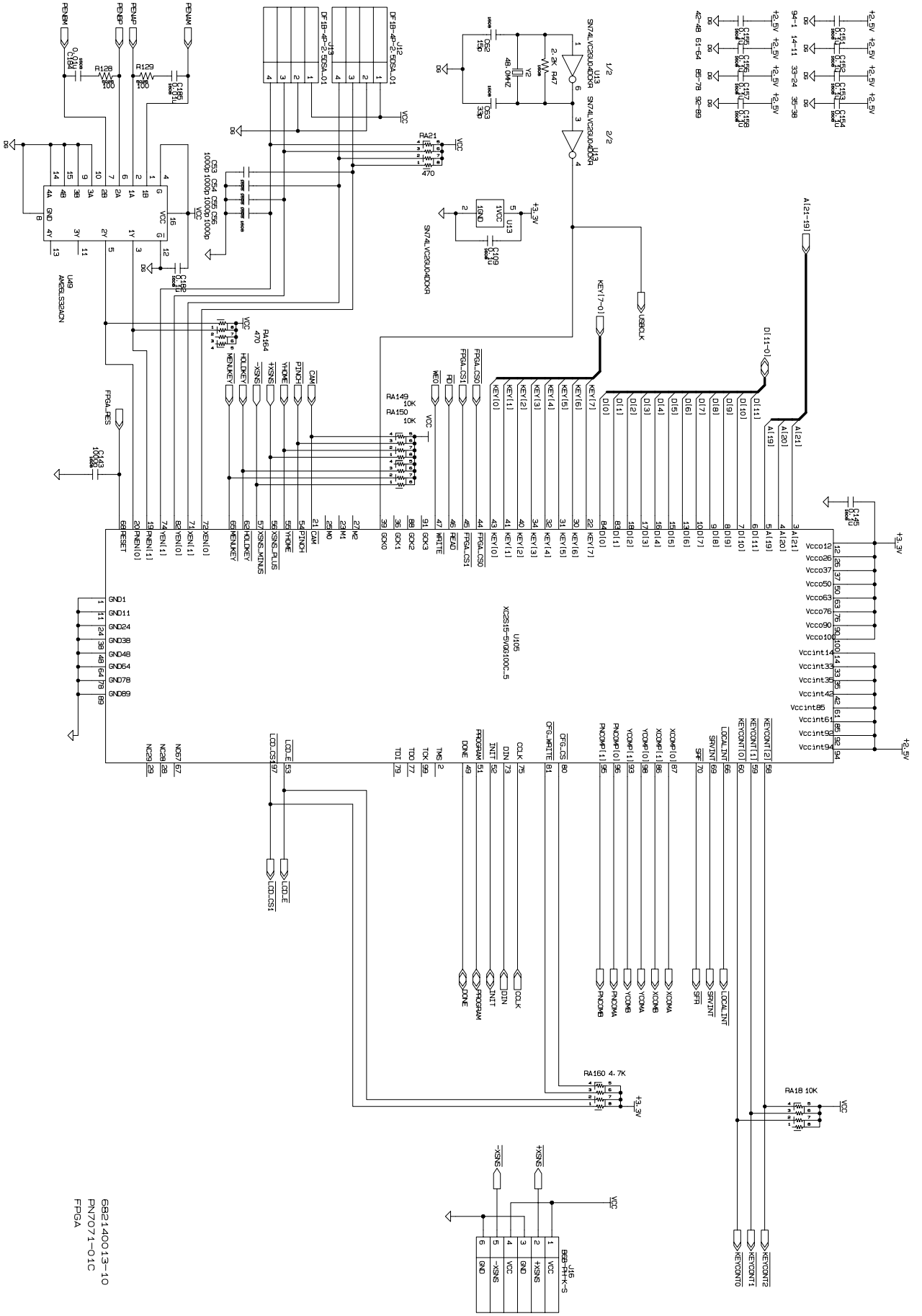
10.2.2 Main Board (CONNECTOR)



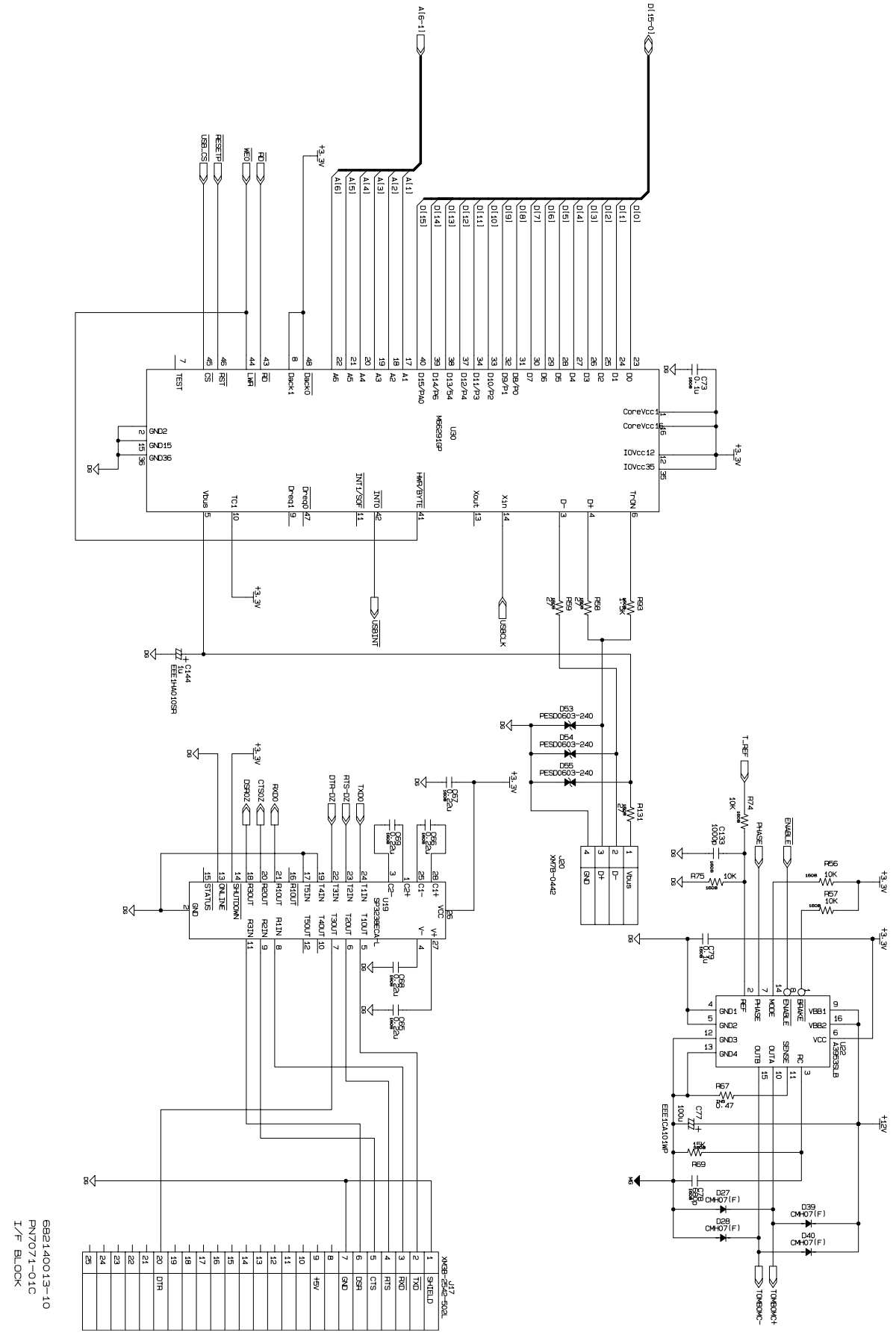
10.2.3 Main Board (MOTOR DRIVER)



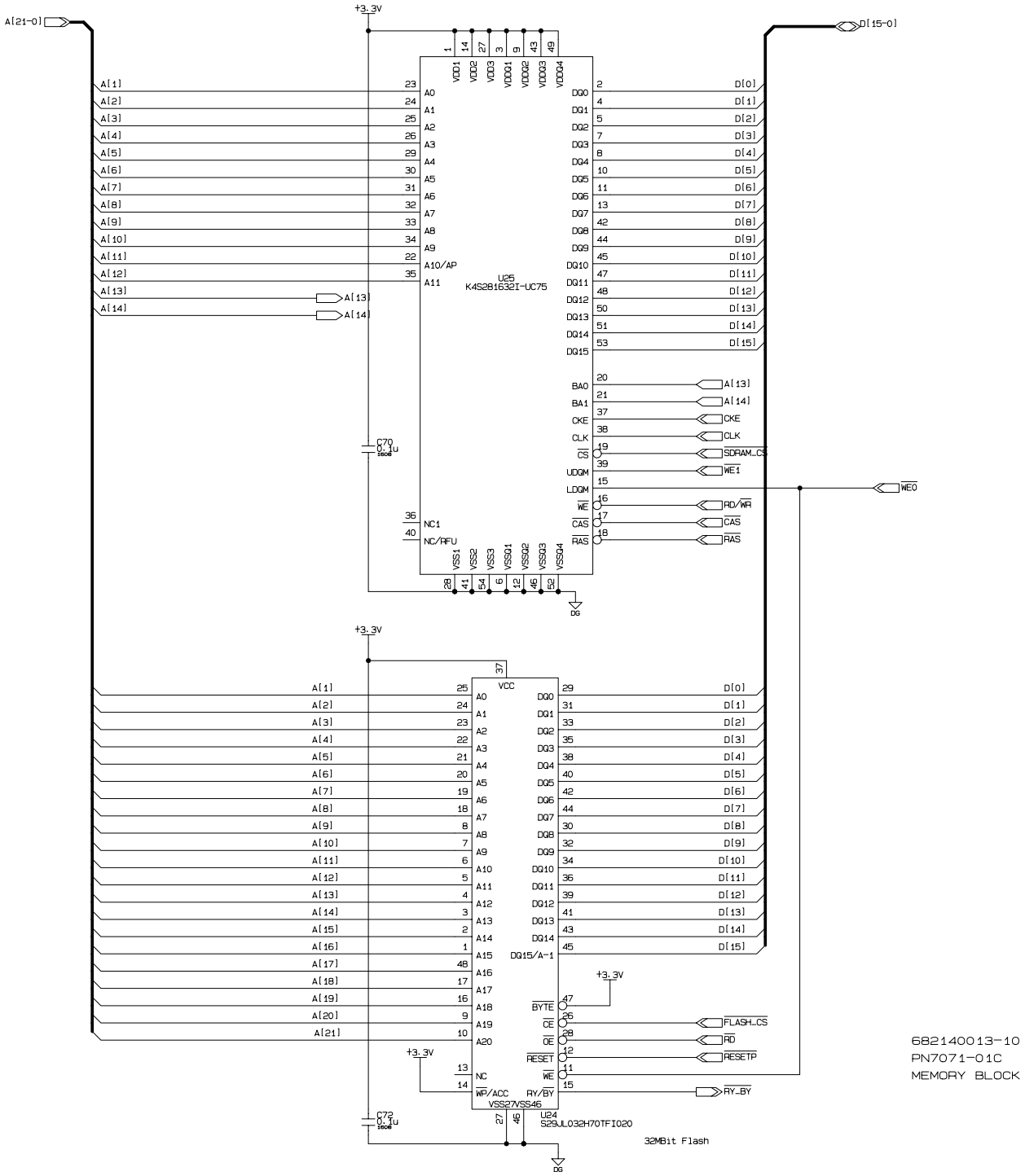
10.2.4 Main Board (FPGA)



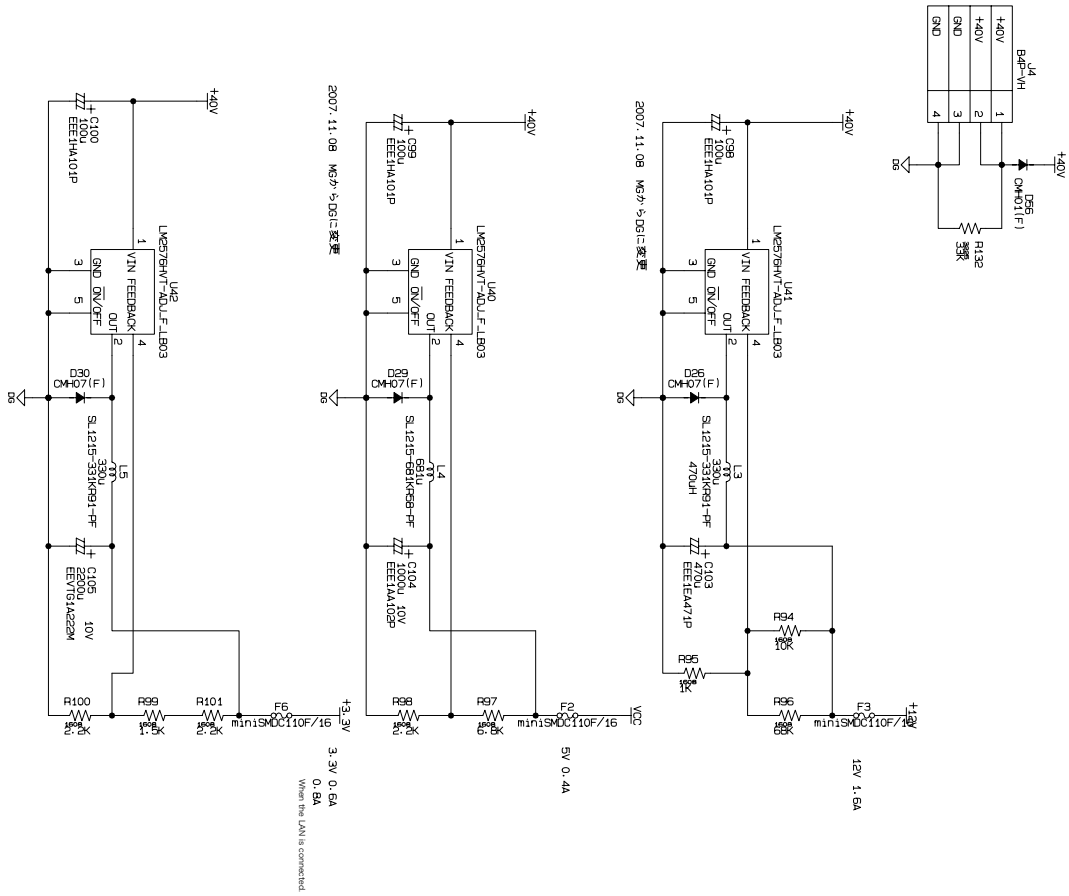
10.2.5 Main Board (I/F)

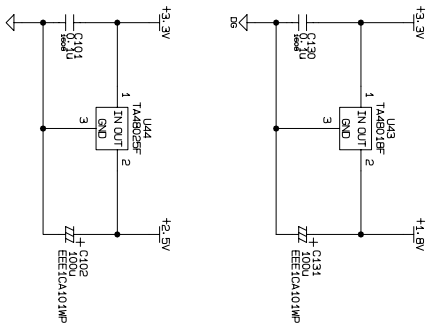


10.2.6 Main Board (MEMORY)



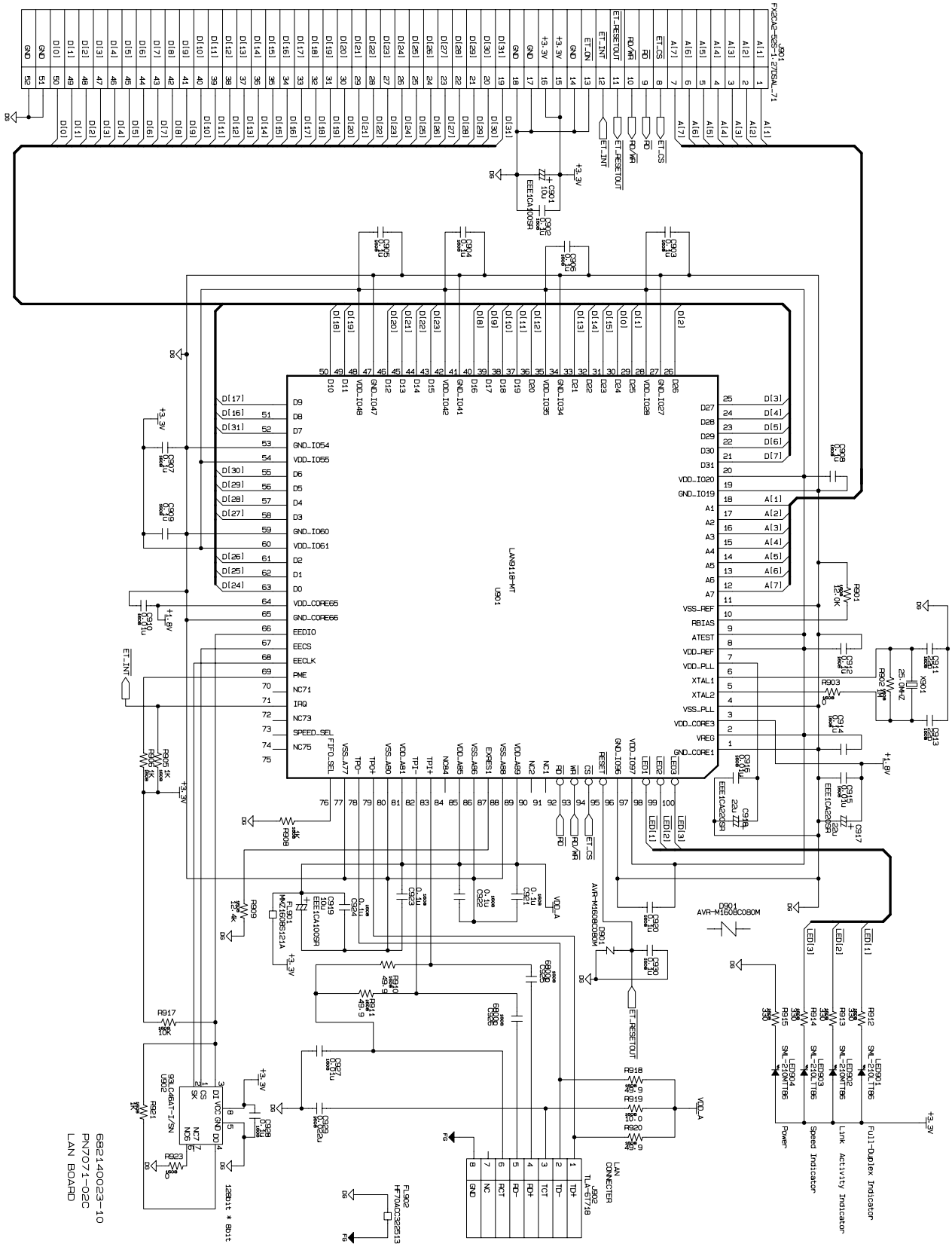
10.2.7 Main Board (Power)



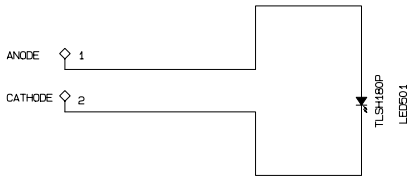


6821400012-10
PN7071-01B
POWER SUPPLY

10.2.8 LAN Board (Option)

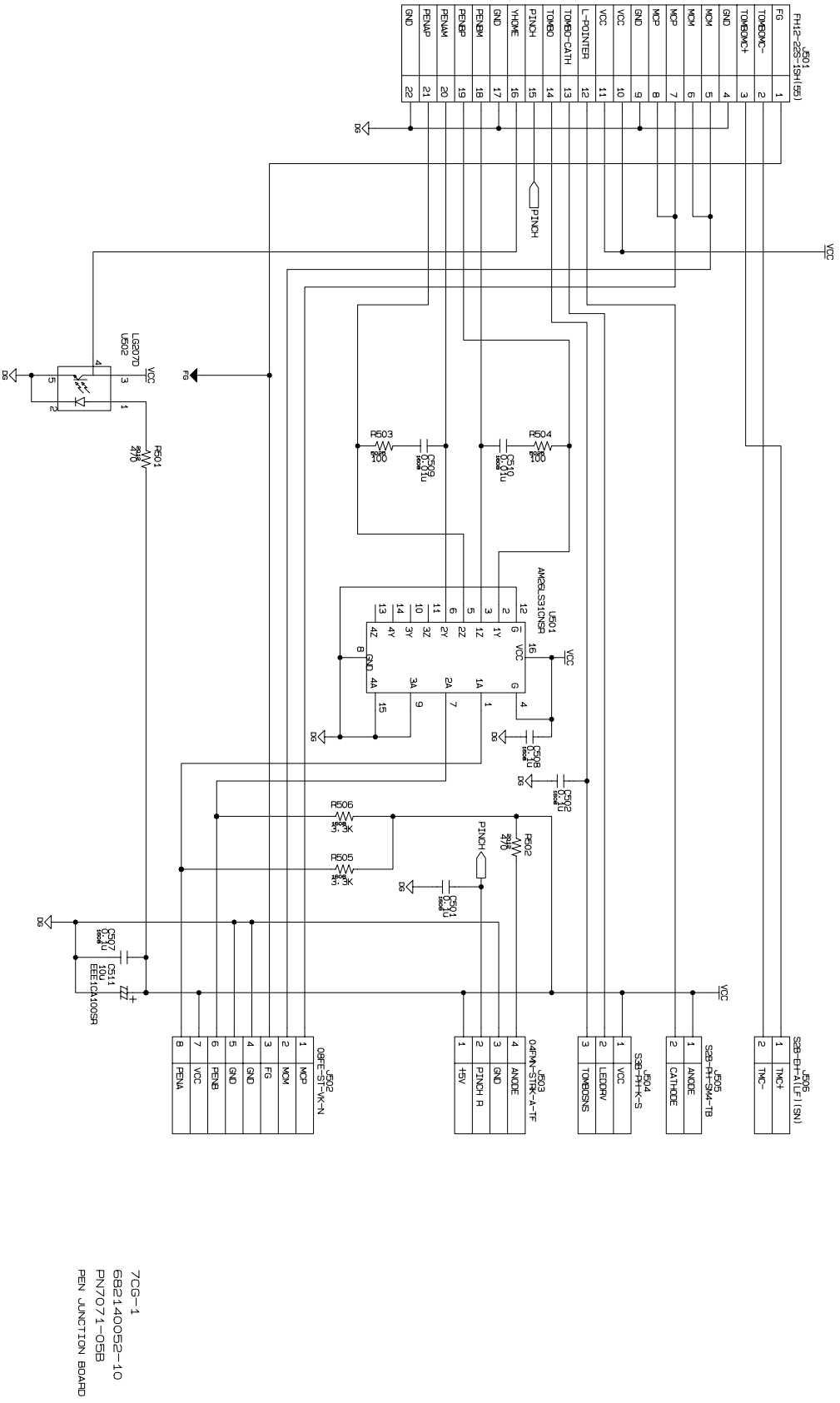


10.2.9 Light Pointer



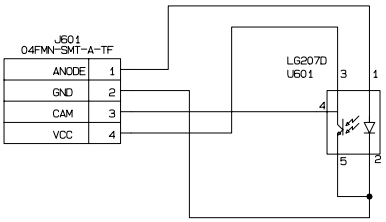
682140040-11
PN7071-04A
LIGHT POINTER

10.2.10 Pen Relay Board



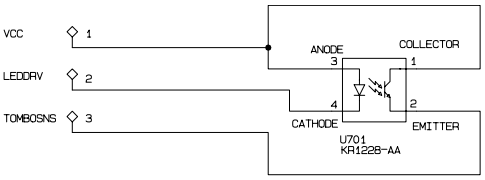
7CG-1
6B21400S2-10
PN7071-05B
PEN JUNCTION BOARD

10.2.11 Pinch Roller Sensor Board



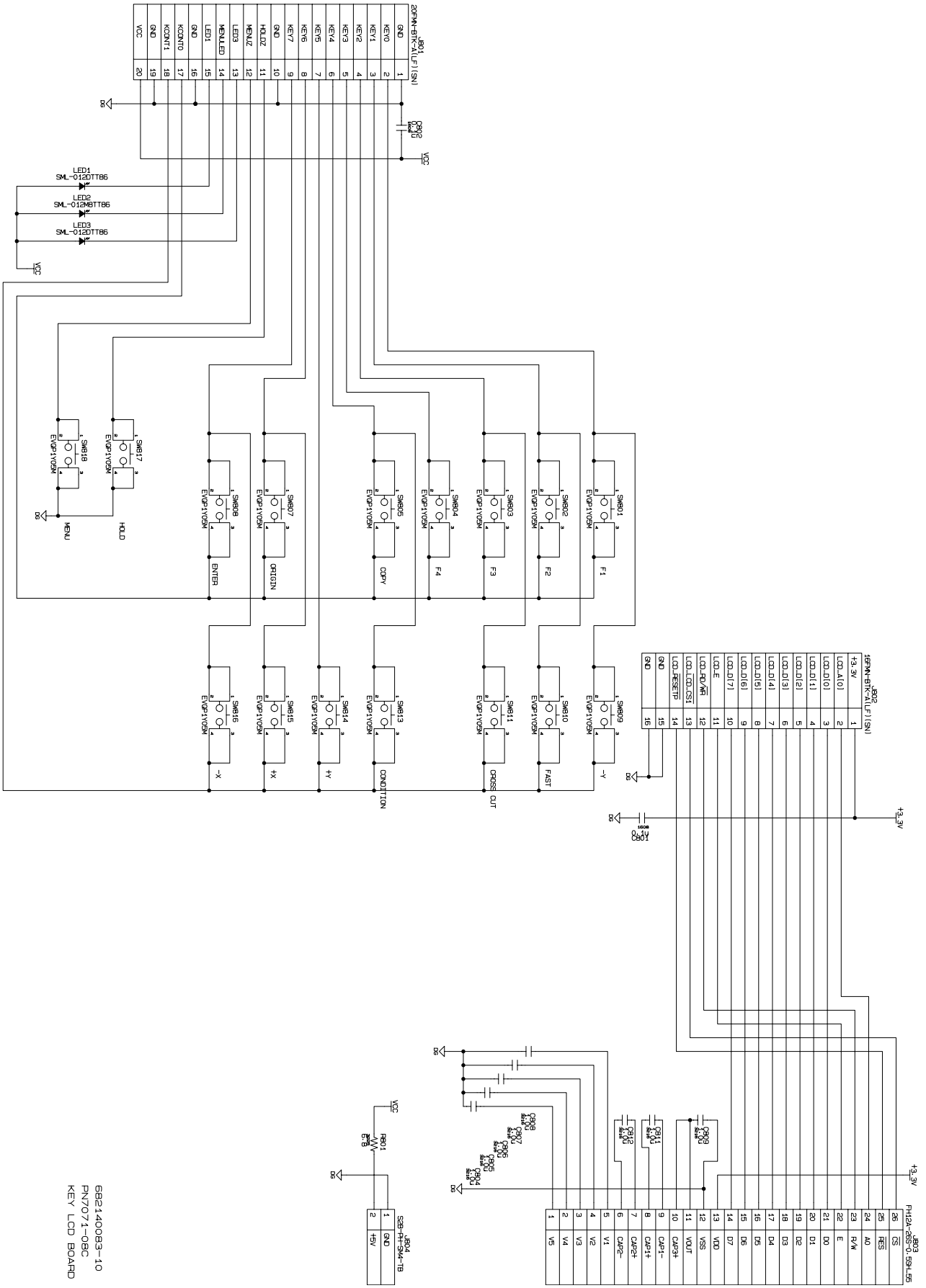
682140062-10
PN7071-06B
PINCH BOARD

10.2.12 RMS Board

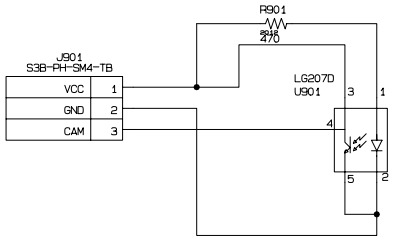


682140072-10
PN7071-07B
RMS SENSOR BOARD

10.2.13 Conrol Panel Board



10.2.14 Cam Sensor Board



682140092-10
PN7071-09B
CAM SENSOR BOARD